

# MDS-M9

## SERVICE MANUAL

*US Model  
Canadian Model  
E Model  
Tourist Model*



MDS-M9 is the Mini disc deck section in DHC-MD7.

US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	MDS-302
MD Mechanism Type	MDM-2B
Base Unit Type	MBU-2
Optical Pick-up Type	KMS-210A/J-N

### SPECIFICATIONS

System	MiniDisc digital audio system	Sampling frequency	44.1 kHz
Disc	MiniDisc	Coding	Adaptive Transform Acoustic Coding (ATRAC)
Recording system	Magnetic field modulation overwrite system	Modulation system	EFM (Eight-to-Fourteen Modulation)
Playback scanning system	No-contact optical scanning (using a semiconductor laser)	Number of channels	2 stereo channels
Laser	Semiconductor laser ( $\lambda = 780 \text{ nm}$ )	Frequency response	5 Hz to 20 kHz $\pm 0.3 \text{ dB}$
Laser output	Max 44.6 $\mu\text{W}$ * * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.	Signal-to-noise ratio	98 dB or more (during playback)
Recording time	74 minutes max. (using MDW-74)	Dimensions	Approx. 280 x 82.5 x 285 mm (11 1/8 x 3 1/4 x 11 1/4 in) (w/h/d) incl. projecting parts and controls
Revolutions	Approx. 400 rpm to 900 rpm (CLV)	Mass	Approx. 2.3 kg (5 lb 1 oz)
Error correction	Advanced Cross Interleave Reed Solomon Code (ACIRC)	Design and specifications are subject to change without notice.	



Mini Disc DECK  
**SONY**®

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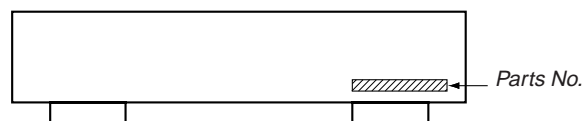
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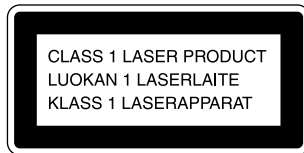
## MODEL IDENTIFICATION

### — BACK PANEL —



	PARTS No.
US,Canadian model	4-977-679-3π
Other model	4-977-679-2π

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.



This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CAUTION	; INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ADVARSEL	; USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	; AVATTAESSA JA SUOJALUKITUS OHITETTAESSA DLET ALTIINNA LASERSÄTEILYLLE.
VARNING	; LASERSTRÅLING NÅR DENNA DEL ÅR OPPNÅD OCH SPÄRREN ÅR URÖPPPLAD.
ADVARSEL	; USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN.

This caution label is located inside the unit.

#### CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

#### Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

#### Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer: Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE

The AC leakage from any exposed metal part to earth Ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

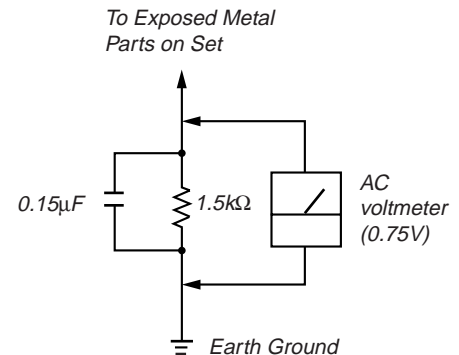


Fig. A. Using an AC voltmeter to check AC leakage.

## SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK  $\triangle$  OR DOTTED LINE WITH MARK  $\triangle$  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

## ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE  $\triangle$  SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

# SECTION 1

## SERVICE NOTE

### Power Supply During Servicing

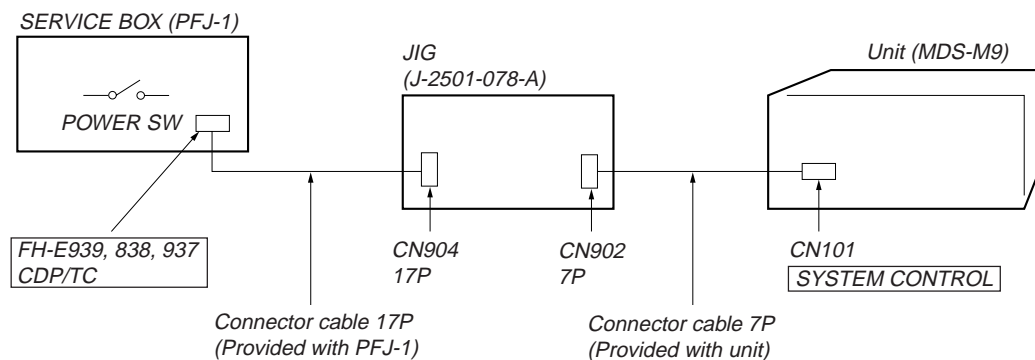
This unit is not able to operate on its own because it does not have its own power supply. During servicing, connect to other units.

Power is supplied when the **SYSTEM POWER** button of the amplifier (TA-M7) is turned ON.

If the other units are not available, use a service box (PFJ-1) and jig (J-2501-078-A).

In this case, press the **■** button, **● REC** button, and **DISPLAY** button simultaneously to turn on the power.

### [Connection Diagram]



### KEY/Fluorescent Indicator Tube/LED Check Mode

Press the **■** button, **● REC** button, and **SHUFFLE** button simultaneously to turn on the key/Fluorescent indicator tube/LED check mode.

During the check mode, press any button or rotate the **SELECTOR** knob to proceed onto the next step.

- ① LED all-lit mode (displays KEY/FL/LED.)
- ↓
- ② Fluorescent indicator tube all lit mode
- ↓
- ③ CHECK 1 lit mode (partially lit)
- ↓
- ④ CHECK 2 lit mode (Partially lit)
- ↓
- ⑤ Key check mode (Displays JOG = 0, KEY = 0)

**Note 1)** When the three buttons pressed to enter the LED all lit mode are released together, the LED all lit mode will remain on. When released separately, the next Fluorescent indicator tube all lit mode will be set.

**Note 2)** The LEDs will light up sequentially after the all lit mode each time the buttons are pressed or the **SELECTOR** knob is rotated.

**Note 3)** In the key check mode, each time the button is pressed, the “KEY =” number on the Fluorescent indicator tube increases. When the **SELECTOR** knob is rotated, the “JOG =” number on the Fluorescent indicator tube increases in the **▶▶** direction and decreases in the **◀◀** direction.

**Note 4)** To end the above mode, remove the amplifier AC plug or turn OFF the PFJ-1 POWER switch.

### Input Switching by Multiple Pressing

The desired input switching can be performed by the following multiple pressing.

**■** button, **● REC** button, and **REPEAT** button : Digital-in

**■** button, **● REC** button, and **CONTINUE** button : Analog-in

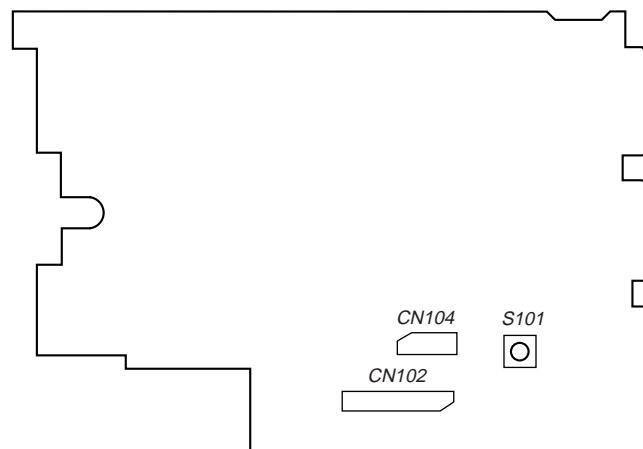
### Forced Reset Switch

The switch on the power board (S101) is the forced reset switch for IC201.

Press it for about one second after turning on the power after disassembling and assembling the unit again.

### • Parts Location

#### [POWER BOARD] — Component side —



### Note for replacement of IC121 and IC171 on the BD board

IC121 on the BD board of this unit has modified from CXD2535AR to CXD2535BR due to an improvement.

Some contents of nonvolatile memory in the IC171 are modified according to this modification. When replacing IC171, the previous contents for IC121 (CXD2535AR) are written as an initialized value from the system control IC. (When replacing IC171, turn the power on once to write an initialized value.)

In case the IC171 on the BD board is replaced, which uses CXD2535BR to IC121, see the following procedure to rewrite the contents of nonvolatile memory. As for replacement of IC121, use CXD2535BR to rewrite the contents of IC171.

**Table Comparison between CXD2535AR and CXD2535BR regarding the contents of nonvolatile memory**

ADDRESS	CXD2535AR	CXD2535BR
15	90	93
2D	33	1A
2E	33	1A

### How to rewrite the nonvolatile memory

- ① Press the **[STOP]** button, **[EDIT/NO]** button and **[REPEAT]** button at the same time when the POWER of set is turned OFF (Be sure to release the three buttons at the same time.)
- ② Turn the **[SELECTOR]** knob to be displayed “EEP MODE”.  
If the **[ENTER/YES]** button is pressed, the display will be changed to “EEP \*\* @@”.  
(\*\* : Address, @@ : data)
- ③ Turn the **[SELECTOR]** knob to be displayed “EEP 15 @@”.
- ④ If the **[SELECTOR]** knob is pressed, “EEP 15 @@ > @@” will be displayed. So turn the **[SELECTOR]** knob to be displayed “EEP 15 @@ > 93”.
- ⑤ Pressing the **[ENTER/YES]** button, “Complete!” is displayed once, “EEP 15 93” is displayed, and the data is rewritten.
- ⑥ As for the address 2D and 2E, rewrite each of them to “1A” following the steps ③ to ⑤ as well.
- ⑦ After the all modification are complete, press the **[EDIT/NO]** button to be displayed “EEP MODE”.
- ⑧ Press the **[REPEAT]** button. In case a disc is unloaded, the display “STANDBY” will be go on and off, then unplug the power plug. In case a disc is loaded, “STANDBY” is displayed once and the disc is ejected. After that, unplug the power plug from an outlet to be out from the EEP rewriting mode.

**Note :** The modification in the contents of nonvolatile memory is not reflected if the power is not turned off once.

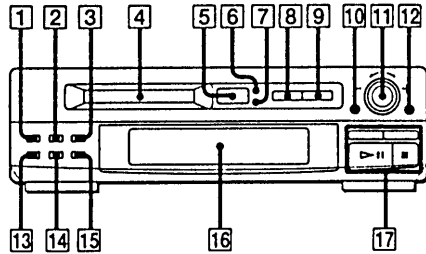
## SECTION 2 GENERAL

This section is extracted from instruction manual.

### Index to Parts and Controls

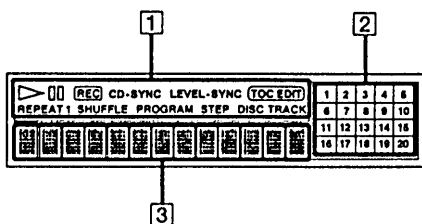
Refer to the pages indicated in parentheses for details on how to use the controls. Controls with an asterisk have indicators on themselves.

#### Front Panel



- 1 REPEAT button (13)
- 2 DISPLAY button (12)
- 3 SCROLL button (21)
- 4 Disc compartment (11)
- 5  $\triangle$  EJECT button (11)
- 6 DIGITAL IN indicator (14)
- 7 ATTENUATOR indicator (15)
- 8 CD SYNC button (15)
- 9  $\bullet$  REC button (16)
- 10 EDIT/NO button (15, 17, 18 – 21)
- 11 SELECTOR control (11, 12, 16, 18 – 21)
- 12 ENTER/YES button (13, 15, 17 – 21)
- 13 CONTINUE button (12, 13)
- 14 SHUFFLE button (12)
- 15 PROGRAM button (13)
- 16 Display window (11, 12, 15, 18 – 21)
- 17 MD deck operating buttons
  - $\ll/\gg$  (manual search) (12, 21)
  - $\triangleright \parallel$  (play/pause) (11, 15, 20)
  - $\blacksquare$  (stop) (11, 15, 18)

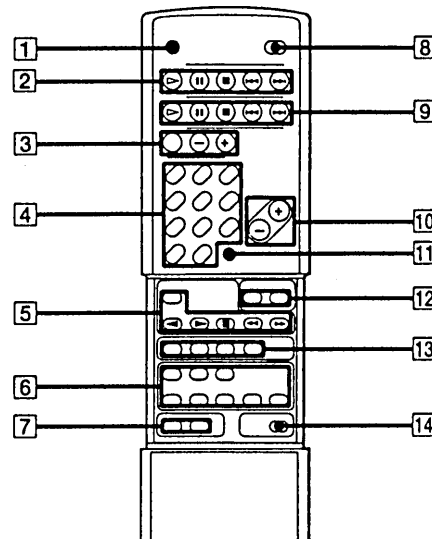
#### Display Window



- 1 MD status indication (11, 15, 18)
- 2 Music calendar (11, 18)
- 3 Playing time/track number/title indication (11 – 13, 18, 21)

#### Remote

For further operation, refer to the pages in parentheses.



- 1 SLEEP button (25)
- 2 MD operating buttons
  - $\triangleright$  (play) (11)
  - $\parallel$  (pause) (11)
  - $\blacksquare$  (stop) (11)
  - $\ll/\gg$  (AMS\*\*) (11)
- 3 Tuner operating buttons (22)
  - BAND button
  - PRESET (+/-) buttons
- 4 CD/Tuner/MD numeric buttons (8, 12, 23)
- 5 Tape operating buttons
  - TAPE button
  - $\blacktriangleleft$  (reverse side play)
  - $\blacktriangleright$  (front side play)
  - $\blacksquare$  (stop)
  - $\ll$  (fast leftward)
  - $\gg$  (fast rightward)
- 6 CD operating buttons
  - CD button (8)
  - REPEAT button (10)
  - TIME button (7)
  - DISC 1 – 3 buttons (7)
  - CHECK button (9)
  - CLEAR button (9)
- 7 TUNER button
  - DISPLAY button (23)

- 8 SYSTEM POWER switch (7)
- 9 CD operating buttons
  - $\triangleright$  (play) (7)
  - $\parallel$  (pause) (7)
  - $\blacksquare$  (stop) (7)
  - $\ll/\gg$  (AMS\*\*) (8)
- 10 VOLUME (+/-) buttons (7, 11, 24, 27)
- 11 MUTING button (24)
- 12 VIDEO 1 button (28)
- VIDEO 2 button (28)
- 13 MD operating buttons
  - REPEAT button (13)
  - DISPLAY button (12)
  - SCROLL button (21)
- 14 SOURCE DIRECT button (24)

\*\* AMS: Automatic Music Sensor

## Chapter 5: Editing Recorded MDs

### Erasing Recordings (erase function)

### Moving Recorded Tracks (move function)

### Dividing Recorded Tracks (divide function)

### Combining Recorded Tracks (combine function)

### Labeling Recordings (title function)

EU 18

You can erase recorded tracks simply by specifying the corresponding track number. Unlike cassette tapes, you do not have to record over a previously recorded track in order to erase it.

There are three methods for erasing a recorded material:

- Erasing a single track
- Erasing all tracks on an MD
- Erasing a portion of a track

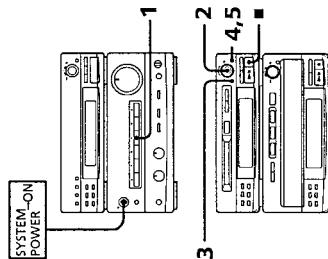
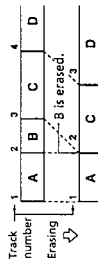
When you erase two or more tracks it is best to start with the track with the highest track number to prevent the renumbering of tracks that have not been erased yet.

When you erase a track, all tracks following the erased one are renumbered. For example, if you erase track 1, the original track 2 will be renumbered as track 1.

### Erasing a Single Track

You can erase a track and the track title simply by specifying its track number.

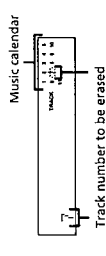
Example: Erasing B



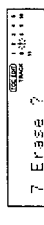
- 1 Press MD to select the MD deck.

### Erasing Recordings (erase function)

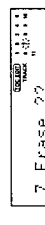
- 2 Turn SELECTOR until the track number you want to erase appears in the display.



- 3 Press EDIT/NO repeatedly until "Erase?" appears in the display.



- 4 Press ENTER/YES. "Erase?" appears in the display.



- 5 Press ENTER/YES again. The track selected in step 2 is erased, and "Complete" appears for a few seconds.

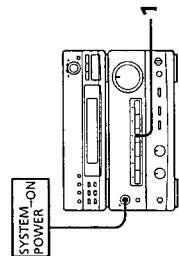
- 6 Repeat steps 2 to 5 to erase more tracks.

To cancel during operation Press ■ on the MD deck.

If "Erase!" ?" appears in the display The track was recorded or edited on another MD deck and is record-protected. If you do erase the track, press ENTER/YES while this indication is displayed.

### Erasing All Tracks on an MD

You can erase all recorded tracks, track titles and the disc title (all information recorded on the MD) at one time. Note that once erased, they cannot be recovered.



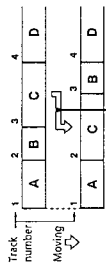
### Moving Recorded Tracks (move function)

You can change the order of tracks by moving a specific track to a track position you want.

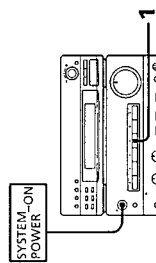
After you move a track

The track numbers between the new and old track positions are automatically renumbered.

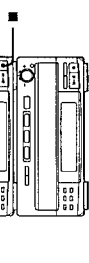
Example: Moving C to track position 2



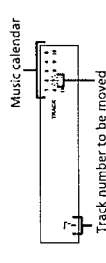
Track C moves to track position 2.



- 3 Press MD to select the MD deck.



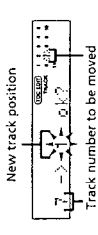
- 2 Turn SELECTOR until the track number you want to move appears in the display.



- 3 Press EDIT/NO repeatedly until "Move ?" appears in the display.

- 4 Press ENTER/YES.

- 5 Turn SELECTOR until the new track position appears.



- 6 Press ENTER/YES. "Complete" appears for a few seconds and the order of tracks changes.

To cancel during operation Press ■ on the MD deck.

### Dividing Recorded Tracks (divide function)

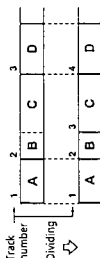
In the following cases, you can divide an existing track into two portions and mark a new track number to randomly access afterwards.

- When multiple tracks are recorded at one track position such as MDs recorded from an analog source.
- When you want to mark a new track number in the middle of the track.

After you divide a track

The total number of tracks on the MD increases by one and all tracks following the divided one are renumbered.

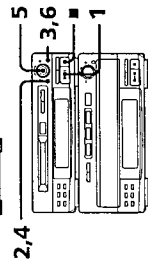
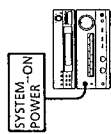
Example: Dividing track 2 to create a new track for C



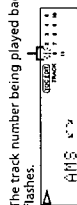
Track 2 is divided, creating a separate track for C, and all the following tracks are renumbered.

continue to next page →





- 1 While playing the MD, press **⏮** on the MD deck at the point where you want to create a new track. The deck stands by for playing.
- 2 Press **EDIT/NO** repeatedly until "Divide ?" appears in the display.
- 3 Press **ENTER/YES**. "Rehearsal" alternates with "Position ok?" in the display, and the starting position of the new track begins playing repeatedly.
- 4 If the starting position is incorrect, press **EDIT/NO**. If it is correct, skip to step 6.



- 5 While monitoring the sound, turn **SELECTOR** to find the starting position of the new track. The starting position of the new track is played back repeatedly. The starting position can be adjusted to a maximum range between -128 and +127 in increments of about 0.06 second each within a track.

- 6 Press **ENTER/YES**. When the track has been divided, "Complete" appears for a few seconds and the newly created track begins playing. The new track will have no track title even if the original track was labeled.

**To cancel during operation**  
Press **■** on the MD deck.

**To undo a track division**  
Continue the tracks again, then redivide the tracks if necessary.

**To divide a track while recording**  
Use the track marking function.

- 4 Press **ENTER/YES**. "Rehearsal" alternates with "Track ok?" in the display. The point where the two tracks will join (e.g., the end of the first track and the beginning of the second track) repeatedly plays back.

- 5 If the point is correct, press **ENTER/YES**. When the tracks have been combined, "Complete" appears for a few seconds. If both of the combined tracks have track titles, the title of the second track is erased.

**To cancel during operation**  
Press **■** on the MD deck.

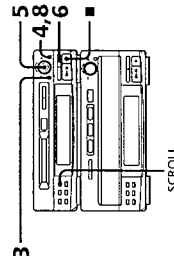
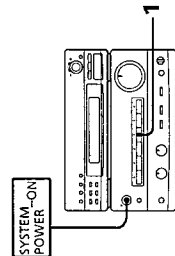
**To undo a track combination**

Divide the tracks again, then repeat the combine function with the correct tracks if necessary.

If "Sorry" appears in the display  
The tracks cannot be combined. This sometimes happens when you have edited the same track many times. This is due to a technical limitation of the MD system, not a mechanical error.

## Labeling Recordings (title function)

You can create titles for your recorded MDs and tracks by using uppercase and lowercase letters, numbers and symbols. You can enter up to about 1,700 characters per disc.



- 1 Press MD to select the MD deck.

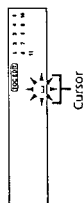
- 2 Press **■** to stop playing when you assign a disc title. Press **▶** to pause the track to be labeled when you assign a track title.

If the track is playing, be sure to finish labeling the track title before it ends. If the track ends before you have completed the labeling procedure, the characters already entered are not recorded and the track will remain unlabeled.

- 3 Press **EDIT/NO** repeatedly until "Name in?" appears in the display.

- 4 Press **ENTER/YES**.

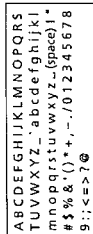
A cursor flashes in the display.



- 5 Turn **SELECTOR** until the desired character appears in the display. The selected character flashes.



You can use the following letters and symbols in titles.



**To enter a space**  
Press **▶** on the MD deck while the cursor is flashing.

- 6 Press **▶**. The cursor shifts to the right and stands by for the input of the next character.



Next Character

- 7 Repeat steps 5 and 6 until you have entered the entire title.

If you entered the wrong character  
Press **◀** or **▶** on the MD deck until the character to be corrected starts flashing, and repeat steps 5 and 6.

**To erase a character**  
Press **◀** or **▶** on the MD deck until the character to be erased starts flashing, then press **EDIT/NO**.

- 8 Press **ENTER/YES**. This completes the labeling procedure and the title appears in the display sequentially.

**To cancel during operation**  
Press **■** on the MD deck.

**To check the titles**  
You can check the disc or track title by pressing **SCROLL**.

Press <b>SCROLL</b> *
Disc title
Track title

- \* Press **SCROLL** again to pause scrolling and again to continue scrolling.

**To delete the title of the disc and the titles of all of the tracks (name erase function)**

You can erase all titles on an MD simultaneously.

Note that once erased, titles cannot be recovered.

- 1 While the deck is stopped, press **EDIT/NO** repeatedly until "Name Erase?" appears in the display.
- 2 Press **ENTER/YES**.
- 3 "Name Erase?" appears in the display. All titles are erased.

**To cancel during operation**  
Press **■** on the MD deck.

**When recording over the existing material**  
You cannot assign a track title.



# For Your Information

## Precautions

### Guide to the Serial Copy Management System

### System Limitations of MD

### MD Display Messages

### Troubleshooting Guide

### Maintenance

### Specifications

### Index to Parts and Controls

### Index

## Precautions

If you have any questions or problems concerning your stereo system, please consult your nearest Sony dealer.

### On operating voltage

Before operating the stereo system, check that the operating voltage of your stereo system is identical with the voltage of your local power supply.

U.S. and Canadian model	120 V AC, 60 Hz
Other models	110 - 120 V or 220 - 240 V AC, 50/60 Hz
	Adjustable with the voltage selector*

- \* The voltage selector is located at the bottom of the apparatus.

### On safety

- The unit is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the unit itself has been turned off.
- Unplug the system from the wall outlet (mains) if it is not to be used for an extended period of time. To disconnect the cord (mains lead), pull it out by the plug. Never pull the cord itself.
- Should any solid object or liquid fall into the component, unplug the stereo system and have the component checked by qualified personnel before operating it any further.
- AC power cord must be changed only at the qualified service shop.

### Caution

The use of optical instruments with this product will increase eye hazard.

### On installation

Place the stereo system in a location with adequate ventilation to prevent heat build-up in the stereo system.

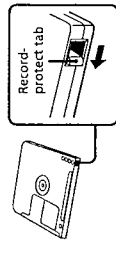
### On condensation in the CD player and the MD deck component

If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens inside the CD player or the MD deck. Should this occur, the CD player or the MD deck will not operate. Remove the CD or the MD and leave the system turned on for about an hour until the moisture evaporates.

## To protect an MD against accidental erasure

To make it impossible to record on an MD, slide the tab in the direction indicated by the arrow, opening the slot. To allow recording, close the slot.

Rear of the disc

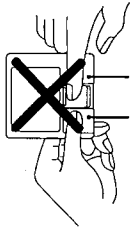


### Notes on handling MDs

Because the MD itself is housed in a cartridge, you can handle it normally without being concerned about dirt or fingerprints. However, malfunctioning may result if the cartridge itself is dirty or warped.

### Do not open the shutter on the MD cartridge

Trying to force the shutter open will damage the shutter.



Shutter Cartridge

### In case color irregularity is observed on nearby TV screen

With the magnetically shielded type of speaker system, the speakers can be installed near a TV set. However, color irregularity may still be observed on the TV screen depending on the type of your TV set.

### If color irregularity is observed...

Turn off the TV set once, then turn it on after 15 to 30 minutes.

### If color irregularity is observed again...

Place the speakers farther away from the TV set.

## Guide to the Serial Copy Management System

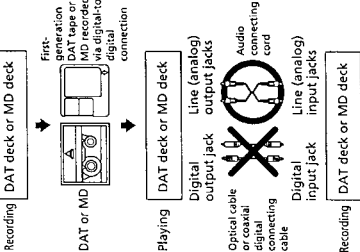
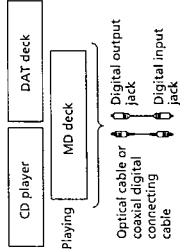
An MD recorded with digital input cannot be used to make another recording with digital input. As a digital audio component, this MD deck conforms with the Serial Copy Management System standards. The Serial Copy Management System restricts copies made by recording digital signals to first-generation copies only.

However, subsequent recording from the first-generation copy onto another recordable DAT tape or MD is possible through the analog input jack on the DAT or MD deck.

There are three general rules that apply to this unit.

### Rule 1

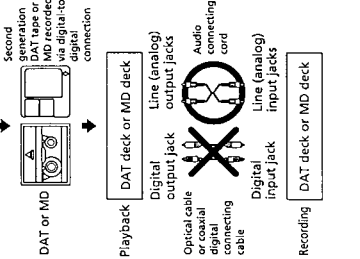
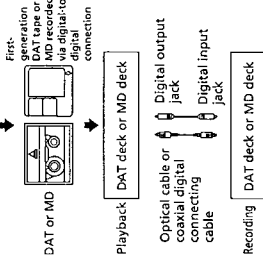
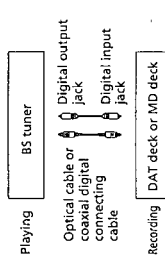
You can record from digital program sources (CDs, DATs or premastered MDs) onto a DAT tape or recordable MD via the digital input jack on the DAT or MD deck. You cannot, however, record from this recorded DAT tape or MD onto another DAT tape or recordable MD via the digital input jack on the DAT or MD deck.



### Rule 2

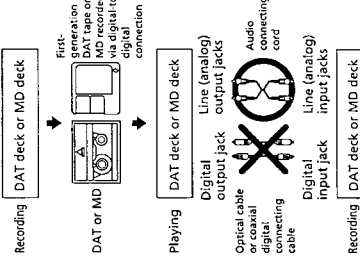
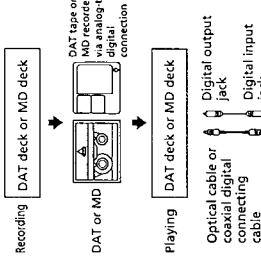
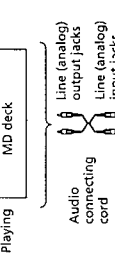
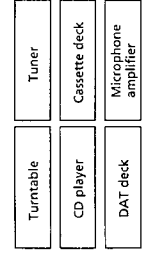
You can record the digital input signal of a digital satellite broadcast onto a DAT tape or recordable MD via the digital input jack on the DAT or MD deck which is capable of handling a sampling frequency of 32 kHz or 48 kHz. (This unit supports 44.1 kHz)

You can then record the contents of this recorded DAT tape or MD (first-generation) onto another DAT tape or recordable MD via digital input jack on the DAT or MD deck to create a second-generation digital copy. Note, however, that on some BS tuners, second-generation digital copying may not be possible.



### Rule 3

You can record a DAT tape or MD on which an analog record, FM broadcast, or other analog source was recorded onto another DAT tape or MD via the DAT or MD deck's digital output jack. You cannot, however, make a second-generation DAT tape or MD copy in the DAT or MD deck's digital output jack.



For Your Information

For Your Information

System Limitations of MD

The MiniDisc (MD) system is a different recording system than that used with conventional cassettes or DAT. As a result, there are several system limitations which may manifest themselves through the following symptoms. Although these do not indicate a malfunction, you should be aware of the causes of these situations.

"Disc Full" appears, even though the maximum recording time (60 minutes, 74 minutes) has not been reached

In the MD system, when the maximum number of tracks has been recorded, "Disc Full" appears in the display, regardless of the total playing time of the tracks. The maximum number of tracks that can be recorded is 255. If you want to record additional tracks, either erase unnecessary tracks or record them on a second MD.

"Disc Full" appears, even though recording time and unused tracks still remain

Fluctuations in emphasis within tracks are sometimes interpreted as track intervals, incrementing the track count and causing "Disc Full" to appear in the display.

The remaining time on the MD does not increase, even though several short tracks have been erased

Because short segments of 12 seconds or less are ignored when the time remaining on an MD appears, erasing several short tracks may not always result in that amount of time being added to the time remaining.

Combining is not always possible

Sometimes it is not possible to combine an edited track.

The sum of the time recorded on an MD and the time remaining may not always equal the maximum recording time (60 minutes, 74 minutes)

Normally, the smallest unit of recording is one "cluster" (about two seconds). Even if a recorded segment is less than two seconds, two seconds worth of space is used. As a result, the time actually used on an MD is less than the maximum recording time. Furthermore, if an MD has a scratch, the affected portion is automatically ignored, so that the amount of available time decreases by a corresponding amount.

When searching in an edited track, the sound may occasionally be interrupted

Tracks may not be numbered accurately

When recording a CD through a digital connection, small extra tracks may be created due to the contents of the CD recording.

In addition, when track marking is performed automatically with Level Sync ON, the track numbers may not be written correctly, depending on the material being recorded.

"TOC Reading" appears for a long time

If the inserted recordable MD is brand new, "TOC Reading" appears in the display longer than for MDs that have been used.

Limitations when recording over an existing track

- The correct remaining recording time may not be displayed.
- You may not be able to record over a track if that track has been recorded over several times already. If this happens, erase the track using the Erase Function.
- The remaining recording time may be shortened out of proportion to the total recorded time.
- Recording over a track to eliminate noise is not recommended since this may shorten the duration of the track.
- You cannot label a track while recording over it.

The correct recorded/playing time may not be displayed during playback of monaural-format MDs

MD Display Messages

The following table explains the various messages that appear in the display.

Message	Meaning
All Erase?	Erase all tracks on an MD? (Erase Function)
Attenuate?	Attenuate the recording level during analog recording?
Auto cut	The MD deck is pausing the recording because silence continued for 30 seconds or more during digital recording.
Blank Disc	The inserted recordable MD is brand new or all tracks on the MD have been erased.
Cannot Copy	You cannot make a digital recording. (See "Guide to the Serial Copy Management System".)

Cannot EDIT	You tried to edit in PROGRAM or SHUFFLE play mode.
Combine?	Combine two tracks into one? (Combine Function)
Din Unlock	The digital signal input was interrupted during digital recording.
Disc Error	The inserted MD is damaged, or does not contain a TOC.

Disc Full	You cannot make recording because there is no time remaining on the disc. (See "System Limitations of MD".)
-----------	---

Divide?	Divide one recorded track into two tracks? (Divide Function)
---------	--

Eject	Displayed when you remove the MD.
-------	-----------------------------------

Erase?	Erase a single track on an MD? (Erase Function)
--------	---

Impossible	You tried to combine from the first track on an MD, which is not possible.
------------	--

LEVEL OVER	A high-level signal was input during analog recording.
------------	--

Move?	Change the order of the tracks by moving tracks to any desired position? (Move Function)
-------	--

Name Full	There is no more space to store track or disc titles. You can enter up to 1792 characters.
-----------	--

Name in?	Create titles for your recorded MDs and tracks? (Title Function)
----------	--

NO DISC	There is no MD in the deck.
No Track	The inserted MD has a disc title but no tracks.

Over	The end of the last track was reached while conducting a high-speed search.
------	---

Protected	The inserted MD is protected against erasure.
-----------	---

Retry	The MD deck is redoing the recording because of vibrations or disc scratches encountered during recording.
-------	--

Retry Error	Because of numerous vibrations or disc scratches, continuous recording attempts have been made but normal recording is not possible.
-------------	--

continue to next page →

→ continued

Smart Space	The signal was input again after silence continued for 30 seconds or less during digital recording.
-------------	---

Sorry	You tried to combine tracks that cannot be combined.
-------	--

STANDBY (flashing)	The material that was recorded last time was not written on the MD properly, or else the unit does not remember what playback status was used last time.
--------------------	--

TOC (flashing)	The MD deck is updating the table of contents (TOC). (Do not move the MD deck or pull out the power cord. If you do, the recorded material may not be saved normally. If you disconnect the power cord immediately after recording, you cannot save the recording.)
----------------	---

TOC Reading	The MD deck is reading the contents of the MD. (If the inserted recordable MD is brand new, "TOC Reading" appears in the display longer than for MDs that have been used.)
-------------	--

TRACK (lighting)	The MD deck is recording a blank portion.
------------------	---

TRACK (flashing)	The MD deck is recording over existing material.
------------------	--

Welcome	Displayed when you insert an MD.
---------	----------------------------------

## SECTION 3 TEST MODE

### 3-1. Setting the Test Mode

Press the STOP (■) button, EDIT/NO (NO) button and REPEAT button at the same time when the POWER of set is turned OFF. (Be sure to release the Three buttons at the same time.)

### 3-2. Exiting the Test Mode

1. Press the REPEAT button.
2. In case a disc is unloaded, the display “STANDBY” will go on and off.  
In case a disc is loaded, the “STANDBY” is displayed once and the disc is ejected.
3. Unplug the power plug from an outlet.

### 3-3. Basic Operations of the Test Mode

All operations are performed using the SELECTOR knob, ENTER/YES (YES) button, and EDIT/NO (NO) button. The functions of these buttons are as follows.

Function	Contents
SELECTOR knob	Changes parameters and modes
YES button	Proceeds onto the next step. Finalizes input.
NO button	Returns to previous step. Stops operations.

### 3-4. Selecting the Test Mode

Eight test modes are selected by turning the SELECTOR knob.

Display	Contents
TEMP ADJUST	Temperature compensation offset adjustment
LDPWR ADJUST	Laser power adjustment
EFBAL ADJUST	Traverse adjustment
FBIAS ADJUST	Focus bias adjustment
FBIAS CHECK	Focus bias check
CPLAY MODE	Continuous playback mode
CREC MODE	Continuous recording mode
EEP MODE	Non-volatile memory mode *

For detailed description of each adjustment mode, refer to 4. Electrical Adjustments.

If a different adjustment mode has been selected by mistake, press the NO button to exit from it.

\* The EEP MODE is not used in servicing. If set accidentally, press the NO button immediately to exit it.

#### 3-4-1. Operating the Continuous Playback Mode

1. Entering the continuous playback mode
  - ① Set the disc in the unit (either MO or CD).
  - ② Rotate the SELECTOR knob and display “CPLAY MODE”.
  - ③ Press the YES button to change the display to “CPLAY IN”.
  - ④ When access completes, the display changes to “C1 = 0000 AD = 00”.  
**Note :** The “0” displayed are arbitrary numbers.
2. Changing the parts to be played back
  - ① Press the YES button during continuous playback to change the display to “CPLAY MID”, “CPLAY OUT”.  
When pressed another time, the parts to be played back can be changed.
  - ② When access completes, the display changes to “C1 = 0000 AD = 00”.  
**Note :** The “0” displayed are arbitrary numbers.
3. Ending the continuous playback mode
  - ① Press the NO button. The display will change to “CPLAY MODE”.
  - ② Press the EJECT button and remove the disc.

**Note 1 :** The playback start addresses for IN, MID, and OUT are as follows.

  - IN 40h cluster
  - MID 300h cluster
  - OUT 700h cluster

### 3-4-2. Operating the Continuous Recording Mode

#### 1. Entering the continuous recording mode

- ① Set the MO disc in the unit.
- ② Rotate the SELECTOR knob and display “CREC MODE”.
- ③ Press the YES button to change the display to “CREC IN”.
- ④ When access completes, the display changes to “CREC ( )” and **REC** lights up.

**Note :** The “ ” displayed are arbitrary numbers.

#### 2. Changing the parts to be recorded

- ① When the YES button is pressed during continuous recording, the display changes to “CREC MID”, “CREC OUT” and **REC** goes off.  
When pressed another time, the parts to be recorded can be changed.
- ② When access completes, the display changes to “CREC ( )” and **REC** lights up.

**Note :** The “ ” displayed are arbitrary numbers.

#### 3. Ending the continuous recording mode

- ① Press the NO button. The display changes to “CREC MODE” and **REC** goes off.
- ② Press the EJECT button and remove the disc.

**Note 1 :** The recording start addresses for IN, MID, and OUT are as follows.

IN 40h cluster  
MID 300h cluster  
OUT 700h cluster

**Note 2 :** The NO button can be used to stop recording anytime.

**Note 3 :** During the test mode, the erasing-protection tab will not be detected. Therefore be careful not to set the continuous recording mode when a disc not to be erased is set in the unit.

**Note 4 :** Do not perform continuous recording for long periods of time above 5 minutes.

**Note 5 :** During continuous recording, be careful not to apply vibration.

### 3-4-3. Non-Volatile Memory Mode

This mode reads and writes the contents of the non-volatile memory.

It is not used in servicing. If set accidentally, press the NO button immediately to exit it.

### 3-5. Functions of Other buttons

Function	Contents
▷	Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF.
■	Stops continuous playback and continuous recording.
▶▶	The sled moves to the outer circumference only when this is pressed.
◀◀	The sled moves to the inner circumference only when this is pressed.
● REC	Turns recording ON/OFF when pressed during continuous playback.
SCROLL	Switches between the pit and groove modes when pressed.
PROGRAM	Switches the spindle servo mode (CLVS and A).
DISPLAY	Switches the display when pressed. Returns to previous step. Stops operations.

**Note :** The erasing-protection tab is not detected during the test mode. Recording will start regardless of the position of the erasing-protection tab when the ● REC button is pressed.

### 3-6. Test Mode Displays

Each time the DISPLAY button is pressed, the display changes in the following order.

MODE display→Error rate display→Address display

1. MODE display

Displays “TEMP ADJUST”, “CPLAY MODE”, etc.

2. Error rate display

Error rates are displayed as follows.

C1 = 0000 AD = 0000

C1 = : Indicates C1 error

AD = : Indicates ADER

3. Address display

Addresses are displayed as follows.

h = 0000 s = 0000 (MO pit and CD)

h = 0000 a = 0000 (MO groove)

h = : Header address

s = : SUBQ address

a = : ADIP address

\* is displayed when the address cannot be read.

### 3-7. Meanings of Other Displays

Display	Contents		
	Light	Off	Blinking
▷	During continuous playback	STOP	
II	Tracking servo OFF	Tracking servo ON	
REC	Recording mode ON	Recording mode OFF	
CD SYNC	CLV LOCK	CLV UNLOCK	
TRACK	Pit	Groove	
DISC	High reflection	Low reflection	
LEVEL SYNC	CLV-S	CLV-A	
STEP	ABCD adjustment completed		
SHUFFLE	<div>           (Focus auto gain successful )            (Tracking auto gain successful )         </div>		<div>           (Focus auto gain successful )            (Tracking auto gain failed )         </div>

### 3-8. Precautions for Use of Test Mode

- ① As loading related operations will be performed regardless of the test mode operations being performed, be sure to check that the disc is stopped before setting and removing it.

Even if the EJECT button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.

Therefore, it will be ejected while rotating.

Always press the NO button first before pressing the EJECT button.

- ② The erasing-protection tab is not detected in the test mode. Therefore, when modes which output the recording laser power such as continuous recording mode and traverse adjustment mode, etc. are set, the recorded contents will be erased regardless of the position of the tab. When using a disc that is not to be erased in the test mode, be careful not to enter the continuous recording mode and traverse adjustment mode.

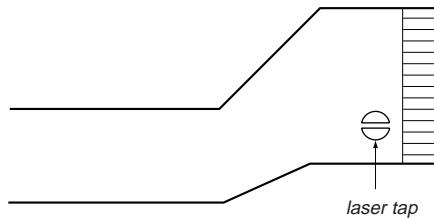
## SECTION 4 ELECTRICAL ADJUSTMENTS

### 4-1. Precautions for Checking Laser Diode Emission

To check the emission of the laser diode during adjustments, never view directly from the top as this may lose your eye-sight.

### 4-2. Precautions for Use of optical pick-up (KMS-210A)

As the laser diode in the optical pick-up is easily damaged by static electricity, solder the laser tap of the flexible board when using it. Before disconnecting the connector, desolder first. Before connecting the connector, be careful not to remove the solder. Also take adequate measures to prevent damage by static electricity. Handle the flexible board with care as it breaks easily.



**Optical pick-up flexible board**

### 4-3. Precautions for Adjustments

1) When replacing the following parts, perform the adjustments and checks with ○ in the order shown in the following table.

	Optical Pick-up	BD Board		
		IC171	D101	IC101, IC121, IC191
1. Temperature compensation offset adjustment	×	○	○	○
2. Laser power adjustment	○	×	×	○
3. Traverse adjustment	○	○	×	○
4. Focus bias adjustment	○	○	×	○
5. Error rate check	○	○	×	○

- 2) Set the test mode when performing adjustments.  
After completing the adjustments, exit the test mode.
- 3) Perform the adjustments in the order shown.
- 4) Use the following tools and measuring devices.
  - MD test disc (CD) TDYS-1 (Parts No. 4-963-646-01)
  - Laser power meter LPM-8001 (Parts No. J-2501-046-A)
  - Oscilloscope
  - Digital voltmeter
  - Thermometer
- 5) When observing several signals on the oscilloscope, etc., make sure that VC and Ground do not connect inside the oscilloscope.  
(VC and Ground will become short-circuited.)

### 4-4. Creating MO Continuously Recorded Disc

\* This disc is used in focus bias adjustment and error rate check. The following describes how to create a MO continuous recording disc.

1. Insert a MO disc (blank disc) commercially available.
2. Rotate the SELECTOR knob and display "CREC MODE".
3. Press the YES button and display "CREC IN".
4. Press the YES button again to display "CREC MID".  
"CREC (0300)" is displayed for a moment and recording starts.
5. Complete recording within 5 minutes.
6. Press the NO button and stop recording.
7. Press the EJECT button and remove the MO disc.

The above has been how to create a continuous recording data for the focus bias adjustment and error rate check.

#### Note :

- Be careful not to apply vibration during continuous recording.

#### 4-5. Temperature Compensation Offset Adjustment

Save the temperature data at that time in the non-volatile memory as 25 °C reference data.

##### Note :

1. Usually, do not perform this adjustment.
2. Perform this adjustment in an ambient temperature of 22 °C to 28 °C. Perform it immediately after the power is turned on when the internal temperature of the unit is the same as the ambient temperature.
3. When D101 has been replaced, perform this adjustment after the temperature of this part has become the ambient temperature.

##### Adjusting Method :

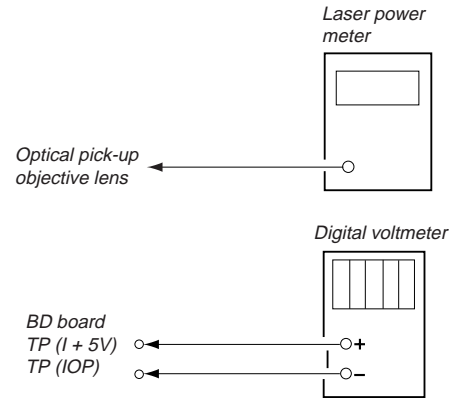
1. Rotate the SELECTOR knob and display "TEMP ADJUST".
2. Press the YES button and select the "TEMP ADJUST" mode.
3. "TEMP = 00.0" and the current temperature data will be displayed.
4. To save the data, press the YES button.  
When not saving the data, press the NO button.
5. When the YES button is pressed, "TEMP = 00.0 SAVE" will be displayed for some time, followed by "TEMP ADJUST".  
When the NO button is pressed, "TEMP ADJUST" will be displayed.

##### Specifications :

The "TEMP = 00.0" should be within "E0 - EF", "F0 - FF", "00 - 0F", "10 - 1F" and "20 - 2F".

#### 4-6. Laser Power Adjustment

##### Connection :



##### Adjusting Method :

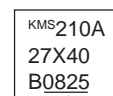
1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the ◀ button or ▶ button and move the optical pickup.)  
Connect the digital volt meter to TP (IOP) and TP (I+5V).
2. Rotate the SELECTOR knob and display "LDPWR ADJUST".  
(Laser power : For adjustment)
3. Press the YES button twice and display "LD \$ 4B = 3.5 mW".
4. Adjust RV102 of the BD board so that the reading of the laser power meter becomes  $3.4^{+0.1}_0$  mW.
5. Press the YES button and display "LD \$ 96 = 7.0 mW".  
(Laser power : MO writing)
6. Check that the laser power meter and digital voltmeter readings satisfy the specified value.

##### Specification :

Laser power meter reading :  $7.0 \pm 0.3$  mW

Digital voltmeter reading : Optical pick-up displayed value  $\pm 10\%$

(Optical pick-up label)



$lop = 82.5$  mA in this case

$lop (mA) = \text{Digital voltmeter reading (mV)} / 1 (\Omega)$

7. Press the YES button and display "LD \$ 0F = 0.7 mW".  
(Laser power : MO reading)
8. Check that the laser power meter at this time satisfies the specified value.

##### Specification :

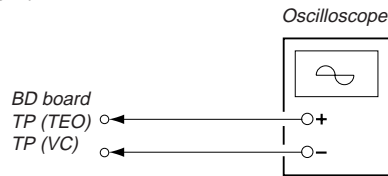
Laser power meter reading :  $0.70 \pm 0.1$  mW

9. Press the NO button and display "LDPWR ADJUST", and stop laser emission.  
(The NO button is effective at all times to stop the laser emission.)



## 4-7. Traverse Adjustment

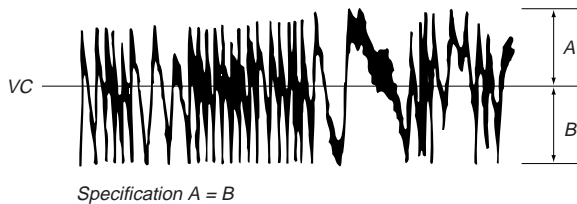
### Connection :



### Adjusting method :

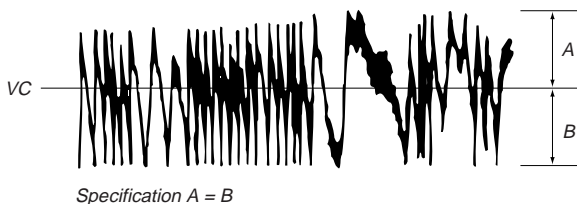
1. Connect an oscilloscope to TP (TEO) and TP (VC) of the BD board.
2. Load a MO disc (any available on the market).
3. Press the ◀ button or ▶ button and move the optical pick-up outside the pit.
4. Rotate the SELECTOR knob and display "EFBAL ADJUST".
5. Press the YES button and display "EFBAL MO-W".  
(Laser power WRITE power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
6. Adjust RV101 of the BD board so that the waveform of the oscilloscope becomes the specified value.  
(MO groove write power traverse adjustment)

(Traverse Waveform)



7. Press the YES button and display "EFB = \$ MO-R".  
(Laser power : MO reading)
8. Rotate the SELECTOR knob so that the waveform of the oscilloscope becomes the specified value.  
(When the SELECTOR knob is rotated, the \$ of "EFB-\$" changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 3%. Adjust the waveform so that the specified value is satisfied as much as possible.  
(MO groove read power traverse adjustment)

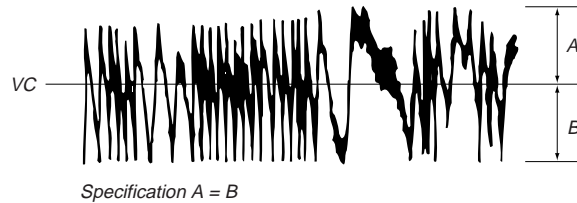
(Traverse Waveform)



9. Press the YES button, display "EFB = \$ SAVE" for a moment and save the adjustment results in the non-volatile memory. Next "EFBAL MO-P" is displayed.
10. Press the YES button and display "EFB = \$ MO-P".  
The optical pickup moves to the pit area automatically and servo is imposed.

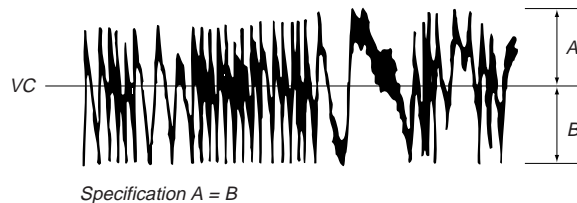
11. Rotate the SELECTOR knob until the waveform of the oscilloscope moves closer to the specified value.  
In this adjustment, waveform varies at intervals of approx. 3%. Adjust the waveform so that the specified value is satisfied as much as possible.

(Traverse Waveform)



12. Press the YES button, display "EFB = \$ SAVE" for a moment and save the adjustment results in the non-volatile memory. Next "EFBAL CD" is displayed. The disc stops rotating automatically.
13. Press the EJECT button and remove the MO disc.
14. Load the test disc TDYS-1.
15. Press the YES button and display "EFB = \$ CD". Servo is imposed automatically.
16. Rotate the SELECTOR knob so that the waveform of the oscilloscope moves closer to the specified value.  
In this adjustment, waveform varies at intervals of approx. 3%. Adjust the waveform so that the specified value is satisfied as much as possible.

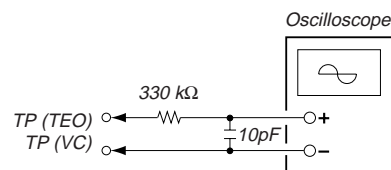
(Traverse Waveform)



17. Press the YES button, display "EFB = \$ SAVE" for a moment and save the adjustment results in the non-volatile memory. Next "EFBAL ADJUST" is displayed.
18. Press the EJECT button and remove the test disc TDYS-1.

**Note 1 :** Data will be erased during MO reading if a recorded disc is used in this adjustment.

**Note 2 :** If the traverse waveform is not clear, connect the oscilloscope as shown in the following figure so that it can be seen more clearly.



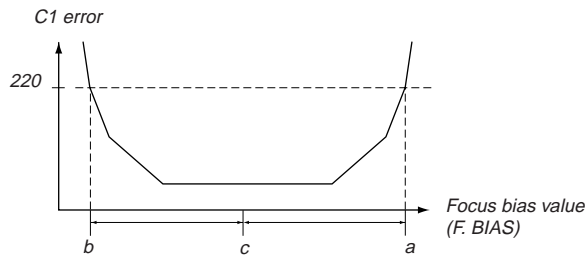
## 4-8. Focus Bias Adjustment

### Adjusting Method :

1. Load a continuously recorded disc (Refer to “4-4. Creating MO Continuously Recorded Disc”).
2. Rotate the SELECTOR knob and display “CPLAY MODE”.
3. Press the YES button twice and display “CPLAY MID”.
4. Press the NO button when “C1 = 0000 AD = 00” is displayed.
5. Rotate the SELECTOR knob and display “FBIAS ADJUST”.
6. Press the YES button and display “0000/00 a = 00”.  
The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [a =] indicate the focus bias value.
7. Rotate the SELECTOR knob in the clockwise direction and find the focus bias value at which the C1 error rate becomes 220.
8. Press the YES button and display “0000/00 b = 00”.
9. Rotate the SELECTOR knob in the counterclockwise direction and find the focus bias value at which the C1 error rate becomes 220.
10. Press the YES button and display “0000/00 c = 00”.
11. Check that the C1 error rate is below 50 and ADER is 00. Then press the YES button.
12. If the “(00)” in “00 - 00 - 00 (00)” is above 20, press the YES button.  
If below 20, press the NO button and repeat the adjustment from step 2 again.
13. Press the NO button and press the EJECT button to remove the continuously recorded disc.

**Note 1 :** The relation between the C1 error and focus bias is as shown in the following figure. Find points a and b in the following figure using the above adjustment. The focal point position C is automatically calculated from points a and b.

**Note 2 :** As the C1 error rate changes, perform the adjustment using the average value.



## 4-9. Error Rate Check

### 4-9-1. CD Error Rate Check

#### Checking Method :

1. Load a test disc TDYS-1.
2. Rotate the SELECTOR knob and display “CPLAY MODE”.
3. Press the YES button twice and display “CPLAY MID”.
4. “C1 = 0000 AD = 00” is displayed.
5. Check that the C1 error rate is below 20.
6. Press the NO button, stop playback, press the EJECT button, and remove the test disc.

### 4-9-2. MO Error Rate Check

#### Checking Method :

1. Load a continuously recorded disc (Refer to “4-4. Creating MO Continuously Recorded Disc”).
2. Rotate the SELECTOR knob and display “CPLAY MODE”.
3. Press the YES button twice and display “CPLAY MID”.
4. “C1 = 0000 AD = 00” is displayed.
5. If the C1 error rate is below 50, check that ADER is 00.
6. Press the NO button, stop playback, press the EJECT button, and remove the continuously recorded disc.

## 4-10. Focus Bias Check

Change the focus bias and check the focus tolerance amount.

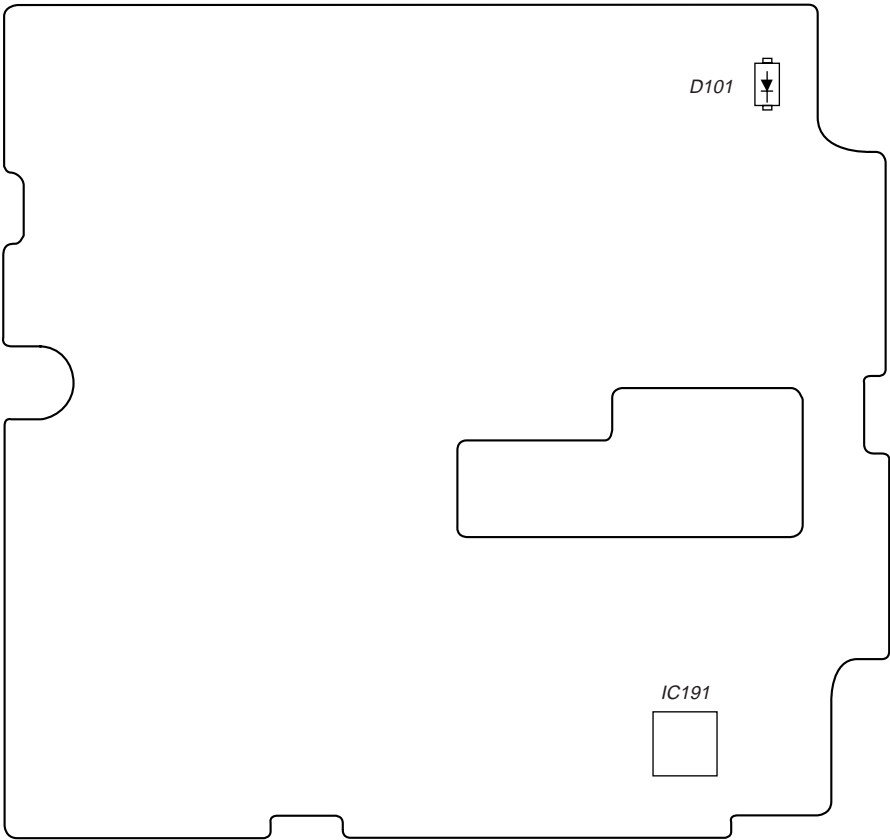
### Checking Method :

1. Load a continuously recorded disc (Refer to “4-4. Creating MO Continuously Recorded Disc”).
2. Rotate the SELECTOR knob and display “CPLAY MODE”.
3. Press the YES button twice and display “CPLAY MID”.
4. Press the NO button when “C1 = 0000 AD = 00” is displayed.
5. Rotate the SELECTOR knob and display “FBIAS CHECK”.
6. Press the YES button and display “0000/00 c = 00”.  
The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value.  
Check that the C1 error is below 50 and ADER is 00.
7. Press the YES button and display “0000/00 b = 00”.  
Check that the C1 error is not below 220 and ADER is not above 00 every time.
8. Press the YES button and display “0000/00 a = 00”.  
Check that the C1 error is not below 220 and ADER is not above 00 every time.
9. Press the NO button, next press the EJECT button, and remove the continuously recorded disc.

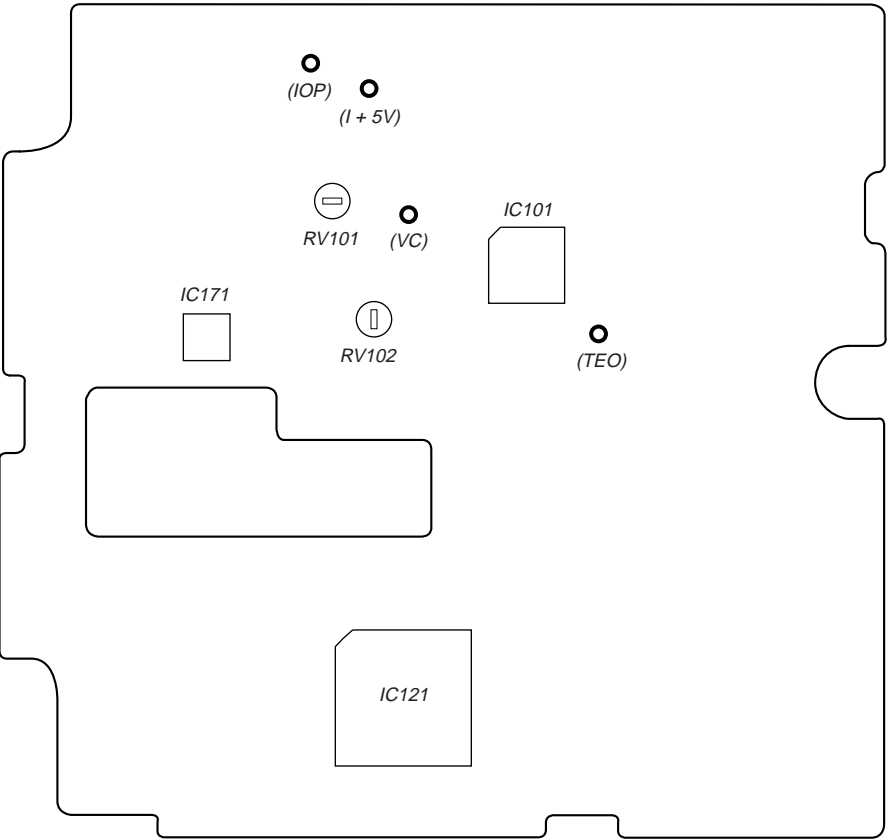
**Note 1 :** If the C1 error and ADER are above 00 at points a or b, the focus bias adjustment may not have been carried out properly. Adjust perform the beginning again.

4-11. Adjusting Points and Connecting Points

[BD BOARD] (Component side)

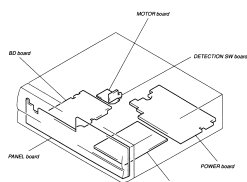


[BD BOARD] (Conductor side)



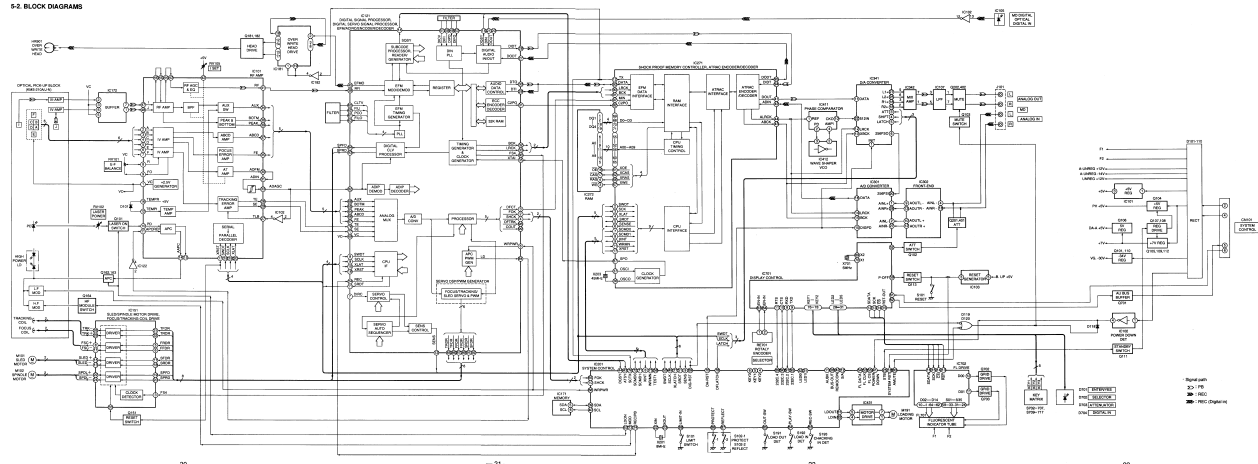
SECTION 5  
DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION



— 19 —

5-2. BLOCK DIAGRAM



— 20 —

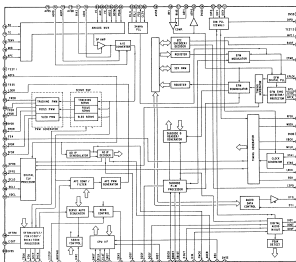
— 21 —

— 22 —

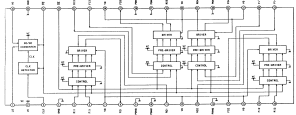
— 23 —

• IC Block Diagrams

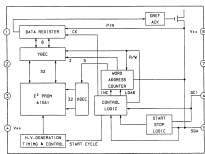
IC121 CXD2588R



IC151 MPC17A30V6EL

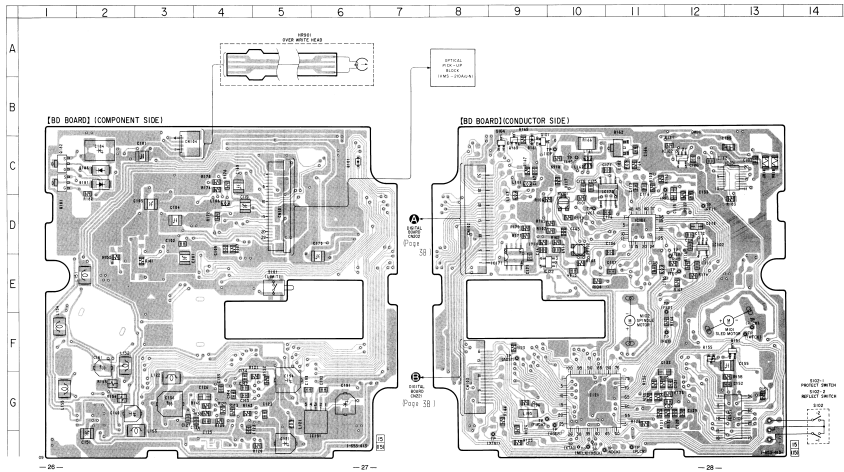


IC171 K24C016



5.3 PRINTED WIRING BOARD - RF SECTION -  
• See page 19 for Circuit Boards Location.

Ref. No.	Location
D101	C-6
D102	F-1
D103	B-8
D104	C-2
D105	C-2
D106	C-2
D107	C-2
D108	C-2
D109	C-2
D110	C-2
D111	C-2
D112	C-2
D113	C-2
D114	C-2
D115	C-2
D116	C-2
D117	C-2
D118	C-2
D119	C-2
D120	C-2
D121	C-2
D122	C-2
D123	C-2
D124	C-2
D125	C-2
D126	C-2
D127	C-2
D128	C-2
D129	C-2
D130	C-2
D131	C-2
D132	C-2
D133	C-2
D134	C-2
D135	C-2
D136	C-2
D137	C-2
D138	C-2
D139	C-2
D140	C-2
D141	C-2
D142	C-2
D143	C-2
D144	C-2
D145	C-2
D146	C-2
D147	C-2
D148	C-2
D149	C-2
D150	C-2
D151	C-2
D152	C-2
D153	C-2
D154	C-2
D155	C-2
D156	C-2
D157	C-2
D158	C-2
D159	C-2
D160	C-2
D161	C-2
D162	C-2
D163	C-2
D164	C-2
D165	C-2
D166	C-2
D167	C-2
D168	C-2
D169	C-2
D170	C-2
D171	C-2
D172	C-2
D173	C-2
D174	C-2
D175	C-2
D176	C-2
D177	C-2
D178	C-2
D179	C-2
D180	C-2
D181	C-2
D182	C-2
D183	C-2
D184	C-2
D185	C-2
D186	C-2
D187	C-2
D188	C-2
D189	C-2
D190	C-2
D191	C-2
D192	C-2
D193	C-2
D194	C-2
D195	C-2
D196	C-2
D197	C-2
D198	C-2
D199	C-2
D200	C-2



NOTE:  
• Through hole  
• (Pattern from the side which enables wiring)  
(The other layer patterns are not indicated)

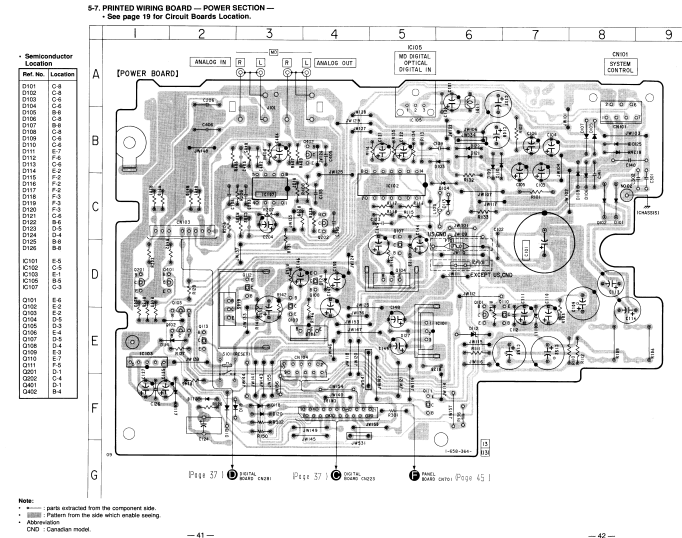




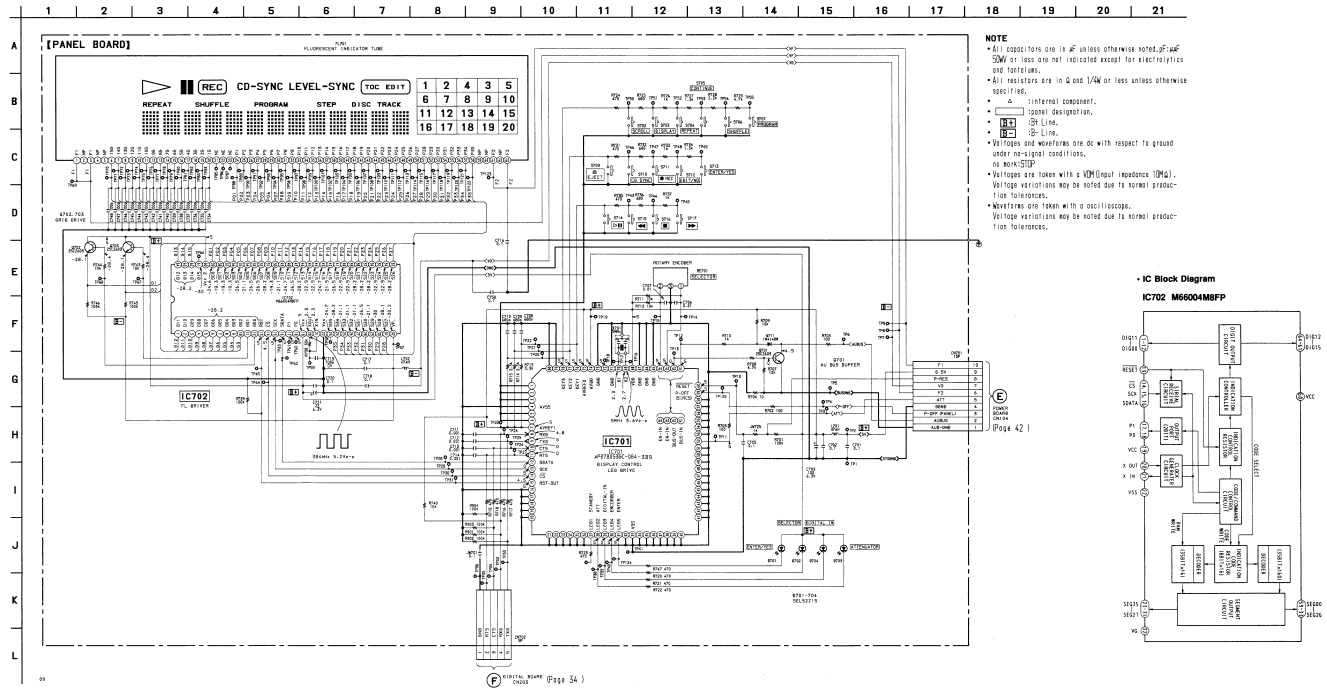


5-6. PRINTED WIRING BOARD — DIGITAL SECTION —  
• See page 19 for Circuit Boards Location.

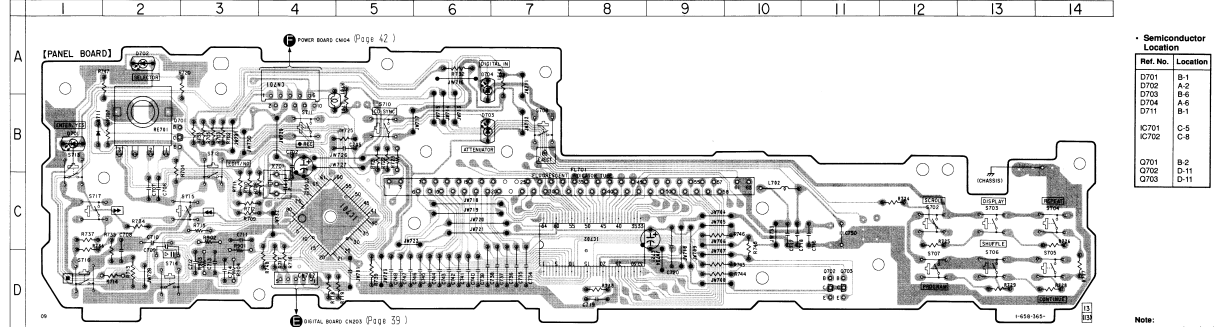




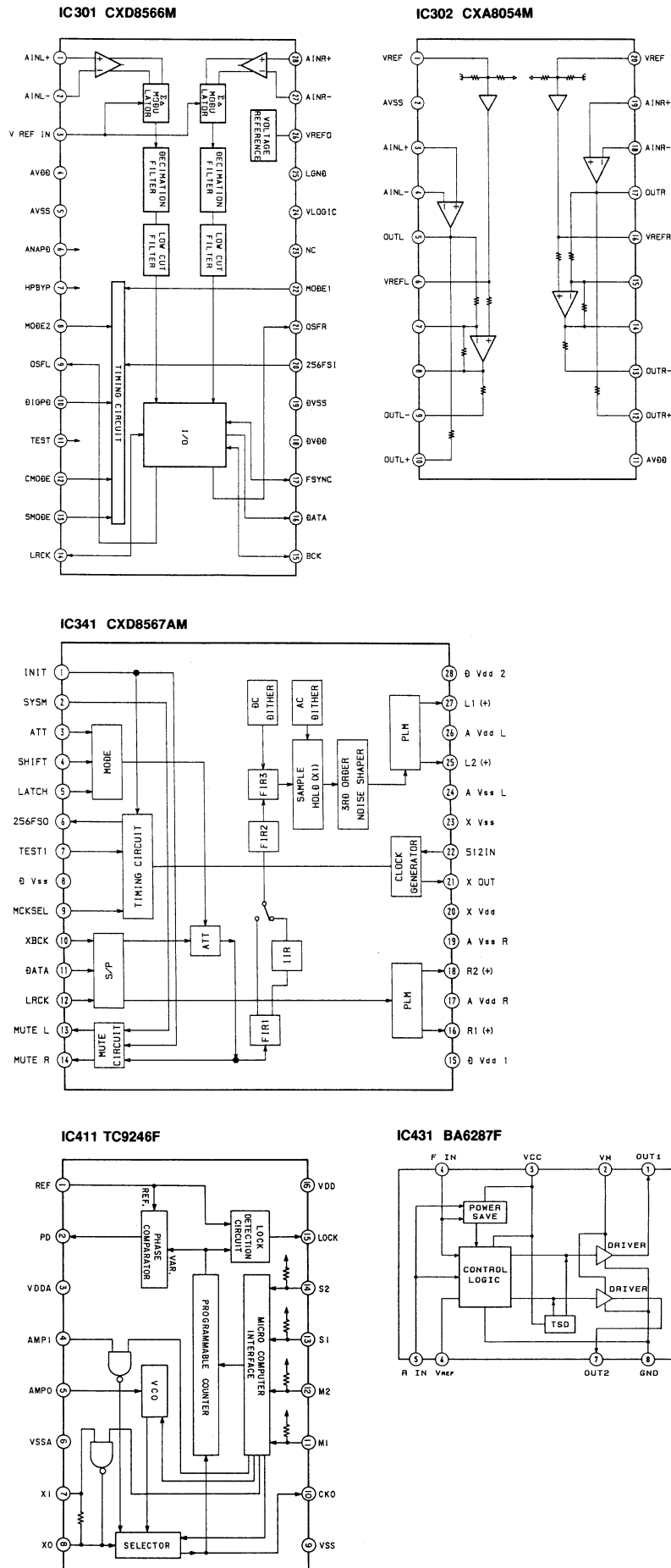
5-9. SCHEMATIC DIAGRAM — PANEL SECTION — • See page 59 for IC Pin Functions. (IC701)



5-10. PRINTED WIRING BOARD — PANEL SECTION — • See page 19 for Circuit Boards Location.



# 5-11. IC BLOCK DIAGRAMS — DIGITAL SECTION —



## 5-12. IC PIN FUNCTION

### • IC101 RF Amplifier (CXA1981AR)

Pin No.	Pin Name	I/O	Function
1	VC	O	Middle point voltage (2.5V) generation output pin
2 to 7	A to F	I	Input of signal from optical block detector
8	FI	I	F operation amplifier input
9	FO	O	F operation amplifier output
10	PD	I	Front monitor. Connected to photo diode
11	APCREF	I	Input pin for setting laser power
12	TEMPI	I	Temperature sensor connection pin
13	GND	—	Ground pin
14	AAPC	O	APC LD amplifier output pin
15	DAPC	O	Not used (Opened)
16	TEMPR	O	Temperature sensor reference voltage output pin
17	XRST	I	Input of reset signal from system controller (IC201). Reset: "L"
18	SWDT	I	Input of write data signal from system controller (IC201)
19	SCLK	I	Input of clock signal from system controller (IC201)
20	XLAT	I	Input of latch signal from system controller (IC201)
21	VREF	O	Reference voltage output. Not used in this unit (Opened)
22	TENV	O	Not used (Opened)
23	THLD	I	Not used (Connected to VC)
24	VCC	—	Power supply pin (+5V)
25	TFIL	I	Not used (Opened)
26	TE	O	Output of tracking error signal to CXD2535BR (IC121)
27	TLB	I	Input pin of add signal to tracking error
28	CSLED	I	Sled error LPF pin
29	SE	O	Output of sled error signal to CXD2535BR (IC121)
30	ADFM	O	ADIP FM signal output
31	ADIN	I	Inputs ADIP FM signal by AC coupling
32	ADAGC	I	Connection pin of external capacitor for ADIP AGC
33	ADFG	O	Output of ADIP dual FM signal to CXD2535BR (IC121) (22.05 kHz $\pm$ 1 kHz)
34	AUX	O	Output of auxiliary signal to CXD2535BR (IC121)
35	FE	O	Output of focus error signal to CXD2535BR (IC121)
36	FLB	I	Not used (Opened)
37	ABCD	O	Output of light amount signal to CXD2535BR (IC121)
38	BOTM	O	Output of bottom hold signal of light amount signal to CXD2535BR (IC121)
39	PEAK	O	Output of peak hold signal of light amount signal to CXD2535BR (IC121)
40	RFAGC	I	Connection pin of RF AGC circuit external capacitor
41	RF	O	Output of playback EFM RF signal to CXD2535BR (IC121)
42	ISSET	I	Internal circuit constant setting pin. 22 kHz BPF center frequency (Fixed at "H")
43	AGCT	I	Inputs RF signal by AC coupling
44	RFO	O	Output pin of RF signal
45	MORFI	I	Inputs MO RF signal by AC coupling
46	MORFO	O	Output pin of MO RF signal
47, 48	I, J	I	Input of signal from optical block detector

• **IC121 Digital signal processor, digital servo processor, EFM/ACIRC encoder/decoder (CXD2535BR)**

Pin No.	Pin Name	I/O	Function
1	FS256	O	11.2896 MHz clock output (MCLK). Not used in this unit (Opened)
2	FOK	O	Output of FOK signal to system controller (IC201) Outputs "H" when focus is set
3	DFCT	O	Outputs defect ON/OFF switching signal to CXD2536R (IC271)
4	SHCK	O	Outputs track jump detection signal to system controller (IC201)
5	SHCKEN	I	Track jump detection enable input. Not used in this unit. (Fixed at "H")
6	WRPWR	I	Inputs laser power switching signal from system controller (IC201)
7	DIRC	I	Not used in this unit. (Fixed at "H")
8	SWDT	I	Inputs write data signal from system controller (IC201)
9	SCLK	I	Inputs serial clock signal from system controller (IC201)
10	XLAT	I	Inputs serial latch signal from system controller (IC201)
11	SRDT	O	Outputs write data signal to system controller (IC201)
12	SENS	O (3)	Outputs internal status (SENSE) to system controller (IC201)
13	ADSY	O	ADIP sync signal output. Not used in this unit (Opened)
14	SQSY	O	Output subcode Q sync (SCOR) to system controller (IC201) Outputs "L" every 13.3 msec. Outputs "H" at all most mostly
15	DQSY	O	Outputs digital-in U-bit CD format subcode Q sync (SCOR) to system controller (IC201). Outputs "L" every 13.3 msec Outputs "H" at all most mostly
16	XRST	I	Inputs reset signal from system controller (IC201). Reset: "L"
17	TEST4	I	Test input (Fixed at "L")
18	CLVSCK	O	Not used in this unit (Opened)
19	TEST5	I	Test input (Fixed at "L")
20	DOUT	O	Digital audio signal output pin (For optical output) Not used in this unit
21	DIN	I	Digital audio signal input pin (For optical input)
22	FMCK	O	ADIP FM demodulation clock signal output
23	ADER	O	ADIP CRC flag output. "H":Error
24	REC	I	Input of recording/playback switching signal from system controller (IC201) Recording: "H". Playback: "L"
25	DVSS	—	Ground pin (Digital)
26	DOVF	I	Digital audio output validity flag input pin. (Fixed at "L")
27	DODT	I	Input pin of 16bit data for digital audio output from CXD2536R (IC271)
28	DIDT	O	Output pin of 16bit data for digital audio input to CXD2536R (IC271)
29	DTI	I	Input pin of recording audio data signal from CXD2536R (IC271)
30	DTO	O (3)	Output pin of playback audio data signal to CXD2536R (IC271)
31	C2PO	O	Outputs C2PO signal to CXD2536R (IC271). (Output indicating data error status) Playback: C2PO ("H"). Digital recording: D.In-Vflag. Analog recording: "L"
32	BCK	O	Outputs bit clock signal (2.8224 MHz) to CXD2536R (IC271) (MCLK)
33	LRCK	O	Outputs L/R clock signal (44.1 kHz) to CXD2536R (IC271) (MCLK)
34	XTAO	O	System clock (512 fs=22.5792 MHz) signal output. Not used in this unit (Opened)
35	XTAI	I	Input of system clock (512fs=22.5792 MHz) signal input from CXD2536R (IC271)
36	MCLK	O	MCLK clock (22.5792 MHz) signal output
37	XBCK	O	Pin 32 (BCK) inversion output
38	DVDD	—	Power supply pin (+5V) (Digital)
39	WDCK	O	WDCK clock (88.2 kHz) signal output (MCL)
40	RFCK	O	RFCK clock (7.35 kHz) signal output (MCLK)



Pin No.	Pin Name	I/O	Function
41	WFCK	O	WFCK clock (7.35 kHz) signal output (Playback: EFM decoder PLL. Recording: EFM encoder PLL)
42	GTOP	O	“H”: Opens playback EFM frame sync protection window Not used in this unit (Opened)
43	GFS	O	“H”: Playback EFM sync and interpolation protection timing match Not used in this unit (Opened)
44	XPLCK	O	EFM decoder PLL clock output (98 fs=4.3218 MHz) Falling edge and EFM signal edge match
45	EFMO	O	EFM signal output (Recording)
46	RAOF	O	Internal RAM overflow detection signal output (decoder monitor output) Outputs “H” when the disc rotation exceeds $\pm 4F$ jitter margin during playback Not used in this unit (Opened)
47	MVCI	I	Digital-in PLL oscillation input. Not used in this unit (Opened)
48	TEST2	I	Test pin (Fixed at “L”)
49	DIPD	O (3)	Digital-in PLL phase comparison output Internal VCO: (Frequency: Low $\rightarrow$ “H”). External VCO: (Frequency: Low $\rightarrow$ “L”)
50	DVSS	—	Ground pin (Digital)
51	DICV	I (A)	Digital-in PLL internal VCO control voltage input
52	DIFI	I (A)	Filter input when digital-in PLL internal VCO is used
53	DIFO	O (A)	Filter output when digital-in PLL internal VCO is used
54	AVDD	—	Power supply pin (+5V) (Analog )
55	ASYO	O	Playback EFM full-swing output (L=VSS, H=VDD)
56	ASYI	I (A)	Playback EFM asymmetry compare voltage input
57	BIAS	I (A)	Playback EFM asymmetry circuit constant current input
58	RFI	I (A)	Inputs playback EFM RF signal from CXA1981AR (IC101)
59	AVSS	—	Ground pin (Analog )
60	CLTV	I (A)	Decoder PLL master clock PLL VCO control voltage input
61	PCO	O (3)	Decoder PLL master clock PLL phase comparison output
62	FILI	I (A)	Decoder PLL master clock PLL filter input
63	FILO	O (3)	Decoder PLL master clock PLL filter output
64	PEAK	I (A)	Inputs peak hold signal for light amount signal from CXA1981AR (IC101)
65	BOTM	I (A)	Inputs bottom hold signal for light amount signal from CXA1981AR (IC101)
66	ABCD	I (A)	Light amount signal from CXA1981AR (IC101)
67	FE	I (A)	Input of focus error signal from CXA1981AR (IC101)
68	AUX1	I (A)	Input of auxiliary signal from CXA1981AR (IC101)
69	VC	I (A)	Input of middle point voltage (+2.5V) from CXA1981AR (IC101)
70	ADIO	O (A)	A/D converter input signal monitor output
71	TEST3	I (A)	Test input (Fixed at “L”)
72	AVDD	—	Power supply pin (+5V) (Analog)
73	ADRT	I (A)	A/D converter operation range upper limit voltage input (Fixed at “H”)
74	ADRB	I (A)	A/D converter operation range lower limit voltage input (Fixed at “L”)
75	AVSS	—	Ground pin (Analog)
76	SE	I (A)	Input of sled error signal from CXA1981AR (IC101)
77	TE	I (A)	Input of tracking error signal from CXD1981AR (IC101)
78	AUX2	I (A)	Auxiliary input pin 2. Not used in this unit. (Fixed at “L”)
79	DCHG	I (A)	Connected to Ground pin
80	APC	I (A)	Laser APC input. Not used in this unit (Fixed at “L”)

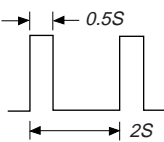


Pin No.	Pin Name	I/O	Function
81	TEST1	I	Test pin (Fixed at “L”)
82	ADFG	I	Input of ADIP dual FM signal from CXA1981AR (IC101) (22.05 kHz $\pm$ 1 kHz) (TTL Schmidt input)
83	TS25	I	Test pin (Fixed at “L”)
84	LDDR	O	Laser APC signal output
85	TRDR	O	Tracking servo drive signal output (–)
86	TFDR	O	Tracking servo drive signal output (+)
87	FFDR	O	Focus servo drive signal output (+)
88	DVDD	—	Power supply pin (+5V) (Digital)
89	FRDR	O	Focus servo drive signal output (–)
90	FS4	O	176.4 kHz clock signal output (MCLK)
91	SRDR	O	Sled servo drive signal output (–)
92	SFDR	O	Sled servo drive signal output (+)
93	SPRD	O	Spindle servo drive signal output (–)
94	SPFD	O	Spindle servo drive signal output (+)
95	DCLO	O	Not used in this unit (Opened)
96	DCLI	I	Not used in this unit (Fixed at “H”)
97	XDCL	O	Not used in this unit (Opened)
98	OFTRK	O	Off track signal output
99	COUT	O	Traverse count signal output
100	DVSS	—	Ground pin (Digital)

\* (3) of I/O is 3-state output, (A) is analog output.

• IC201 System Control (M37610MD-067FP)

Pin No.	Pin Name	I/O	Function
1	C.SET1	I	Not used in this unit (Fixed at “L”)
2	C.SET2	I	
3	KEY3	I	
4 to 6	KEY 2 to KEY 0	I	Not used in this unit (Fixed at “H”)
7	—	I	Not used in this unit (Fixed at “L”)
8	XINT	I	Interrupt status input from CXD2536R (IC221)
9	SENS	I	Internal status (SENSE) input from CXD2535BR (IC121)
10	SHCK	I	Track jump signal input from CXD2535BR (IC121)
11	AUBK	I	Not used in this unit (Fixed at “L”)
12	$\overline{S}/A$	O	Not used in this unit (Opened)
13	BEEP SW	I	Not used in this unit (Fixed at “L”)
14	$\overline{REC}/OTHER$	O	
15	BEEP	O	Not used in this unit (Opened)
16	F. BIAS/C2	I	Not used in this unit (Fixed at “L”)
17	GND (CNVSS)	—	Ground pin
18	SYSTEM RST	I	System reset signal input “L” is input for several hundreds msec after the power supply activation, then it is changed to “H”.
19	XIN T	I	Not used in this unit. (Fixed at “L”)
20	XOUT T	O	
21	GND	—	Ground pin
22	XIN	I	Clock input (8MHz)
23	XOUT	O	Clock output (8MHz)
24	+5V	—	Power supply (+5V)
25	STB	O	Strobe signal output to the power supply circuit. ON: “H”, standby: “L”.
26, 27	MIC SW	I	Not used in this unit (Fixed at “L”)
28	BUS OUT	O	
29	—	O	
30	LED 2	O	
31	LED 1	O	
32	LED 0	O	
33	C1	I	
34	ADER	I	
35	NC	I	
36	MASTER/SLAVE	I	
37, 38	JOG 1, JOG 0	I	
39	SDA	I/O	Data signal input/output with the backup memory (IC171)
40	SCL	O	Clock signal output to the backup memory (IC171)
41	POWER DOWN	I	Power down detection input. Normally, “H” is input.
42	REMOCON	I	Remote control signal input. Not used in this unit (Fixed at “H”)
43	SQSY	I	ATP addressing or subcode Q sync (SCOR) input from CXD2535BR (IC121). “L” is input every 13.3 msec. Normally “H”.
44	DQSY	I	Digital-in U-bit CD format subcode Q sync (SCOR) input from CXD2535BR (IC121). “L” is input every 13.3 msec. Normally “H”.
45 to 47	—	O	Not used in this unit (Fixed at “L”)

Pin No.	Pin Name	I/O	Function
48	—	I	Not used in this unit (Fixed at “L”)
49	SCLK	O	Clock signal output to the serial bus
50	SWDT	O	Write data signal output to the serial bus
51	SRDT	I	Read data signal input from the serial bus
52	—	I	
53	FLCLK	O	Not used in this unit (Fixed at “L”)
54	FLDATA	O	
55	FLCS	O	
56	—	I	
57	TEST 0	I	
58	TEST 1	O	Reset signal output to CXD2536R (IC221)
59, 60	—	I	Not used in this unit (Fixed at “L”)
61	AFAST	I	
62	SLOW	I	
63	LDON	O	Laser ON/OFF control output. “H”: Laser ON.
64	PIT/GRV	I	Pit/groove detection input. “H” is input for the playback-only disc or TOC area. Not used in this unit. (Fixed at “L”)
65	FOK	I	FOK signal input from CXD2535BR (IC121) “H” is input when focusing.
66	MON	I	Not used in this unit. (Pull down when input.)
67	LOCK	O	Not used in this unit. (Pull down when output.)
68	WRPWR	O	Laser power switching signal output to the optical block and CXD2535BR (IC121)
69	DIG RST	O	Reset signal output to CXD1981AR (IC101) and CXD2535BR (IC121) and motor driver (IC151). Reset: “L”.
70	DA RST	O	Reset signal output to the D/A converter (IC341), A/D converter (IC301). Reset: “L”.
71, 72	SCMD 1, SCMD 0	O	Serial command control mode output to CXD2536R (IC221)
73	MOD	O	<p>Laser modulation switching signal output Playback power: “L”, stop: “H”. Recording power:</p> 
74	REC/PB	O	Record/playback switching signal output to CXD2535BR (IC121). Recording: “H”, playback: “L”.
75	WR/MN	O	Write/monitor mode switching signal output to CXD2536R (IC221)
76	SCTX	O	Write data transfer timing output to CXD2536R (IC221) Also serves as ON/OFF output of the magnetic head.
77	XLATCH	O	Latch signal output to the serial bus
78	DALAT	O	Latch signal output to the D/A converter (IC341).
79	DF MUTE	O	Not used in this unit (Fixed at “L”)
80	AMUTE	O	Line out muting output

Pin No.	Pin Name	I/O	Function
81	LDOUT	O	Loading motor (M191) control output*1
82	LDIN	O	
83	REC-SW	I	Detection input from the chucking-in switch (S193). When chucking: “L”.
84	PLAYSW	I	Detection input from the loading-in switch (S191). When the magnetic head is lowered: “L”, others: “H”.
85	OUTSW	I	Detection input from the loading-out switch (S192). When loaded out: “L”, others: “H”.
86	PROTECT	I	Recording-protect claw detection from the protect detection switch (S102-1). When protected: “H”.
87	REFLECT	I	Disc reflection rate detection from the reflect detection switch (S102-2). Disc with lower reflection rate: “H”.
88	LIMIT IN	I	Detection from the limit-in switch (S101). Sled limit-in: “L”.
89	232C.4	O	UART data transmission request signal output to display control (IC701).
90	232C.3	I	UART data transmission request signal input from display control (IC701).
91	232C.2	I	UART data input from display control (IC701).
92	232C.1	O	UART data output to display control (IC701).
93 to 96	—	O	Not used in this unit (Fixed at “L”)
97	AVSS (AGND)	—	Ground pin
98	VREF (+5V)	I	Reference voltage input (+5V)
99	TIMER REC/PLAY	I	Timer recording/playback/OFF switching input. Not used in this unit (Fixed at “L”)
100	INPUT SELECT	I	Select signal input from input signals (analog/digital input). Analog input: “L”, digital input: “H”. Not used in this unit (Fixed at “L”)

\* 1 Loading motor control

Operation Pin	IN	OUT	BRAKE
LDIN 82 pin	“H”	“L”	“H”
LDOUT 81 pin	“L”	“H”	“H”

• **IC271 Shock-Proof Memory Controller, ATRAC Encoder/Decoder (CXD2536R)**

Pin No.	Pin Name	I/O	Function
1	VDD	—	Power supply pin (+5V)
2	SWDT	I	Input of write data signal from system controller (IC201)
3	SCK	I	Input of serial clock signal from system controller (IC201)
4	XLAT	I	Input of serial latch signal from system controller (IC201)
5	SRDT	O/Z	Output of read data signal to system controller (IC201)
6	SENSE	O/Z	Output of internal status (SENSE) to system controller (IC201)
7	SCMD0	I	Input of serial command control mode from system controller (IC201) (Fixed at “H”)
8	SCMD1	I	
9	XINT	O	Output of interrupt status to system controller (IC201)
10	RCPB	I	Recording/playback switching input. Not used in this unit (Fixed at “L”)
11	WRMN	I	Input of write/monitor mode switching signal (Fixed at “L”)
12	TX	I	Input of write data transmission timing from system controller (IC201) Also used as magnetic field head ON/OFF output
13	VSS	—	Ground pin
14	SICK	I	Chip reservation pin (Fixed at “L”)
15	IDSL	I	
16	XILT	I	Chip reservation pin (Fixed at “H”)
17	XRST	I	Input of reset signal from system controller (IC201). Reset: “L”
18 to 21	TS0 to TS3	I	Test pin (Fixed at “L”)
22	EXIR	I	Chip reservation pin (Fixed at “L”)
23	SASL	I	Block selection in single use. “L”: ATRAC. “H”: RAM controller (Fixed at “L”)
24	SNGLE	I	Normally fixed at “L. Fixed at “H” when used as ATRAC or RAM controller for single. (Fixed at “L”)
25	VSS	—	Ground pin
26	AIRCPB	O	Output pin of ATRAC and external audio block recording/playback mode signal. Not used in this unit (Opened)
27	XRQ	I/O	ATRAC I/F XRQ signal input/output pin. Not used in this unit (Opened)
28	ADTO	I/O	ATRAC decode data signal input/output pin. Not used in this unit (Opened)
29	ADTI	I/O	ATRAC encode data signal input/output. Not used in this unit (Opened)
30	XALT	I/O	ATRAC I/F XALT signal input/output pin. Not used in this unit (Opened)
31	ACK	I/O	ATRAC I/F ACK signal input/output pin. Not used in this unit (Opened)
32	AC2	I/O	ATRAC I/F error data signal input/output pin. Not used in this unit (Opened)
33	LCHST	I/O	ATRAC I/F Lch start data signal input/output pin. Not used in this unit (Opened)
34	EXE	I/O	ATRAC I/F EXE signal input/output pin. Not used in this unit (Opened)
35	MUTE	I/O	ATRAC I/F MUTE signal input/output pin. Not used in this unit (Opened)
36	OSCO	O	Clock output (45 MHz)
37	OSCI	I	Clock input (45 MHz)
38	VSS	—	Ground pin
39	ATT	I/O	ATRAC I/F ATT signal input/output pin. Not used in this unit (Opened)
40	F86	O	ATRAC block 11.6 msec timing signal output pin. Not used in this unit (Opened)
41	DOUT	O	Output of monitor/decode audio data signal to D/A converter (IC341)
42	ADIN	I	Input of recording signal from A/D converter (IC301)
43	ABCK	O	Output of bit clock signal to A/D and D/A converters (IC301, IC341)
44	ALRCK	O	Output of L/R clock to A/D and D/A converters (IC301, IC341)
45 to 47	SA2 to SA0	O	Address signal output. Not used in this unit (Opened)

\* O/Z: In case of no output data, it becomes high impedance.

Pin No.	Pin Name	I/O	Function
48, 49	A11, A10	O	Address signal output. Not used in this unit (Opened)
50	VSS	—	Ground pin
51	VDD	—	Power supply pin (+5V)
52 to 55	A03 to A00	O	Output of address signal to RAM (IC272)
56 to 60	A04 to A08	O	
61	XOE	O	Output of output enable control signal to RAM (IC272)
62	XCAS	O	Output of column address strobe signal to RAM (IC272)
63	VSS	—	Ground pin
64	XCS	O	Output of chip select signal to RAM (IC272). Not used in this unit (Opened)
65	A09	O	Output of address signal to RAM (IC272)
66	XRAS	O	Output of row address strobe signal to RAM (IC272)
67	XWE	O	Output of read/write control signal to RAM (IC272)
68, 69	D1, D0	I/O	Input/output pin of data signal to/from RAM (IC272)
70, 71	D2, D3	I/O	
72 to 74	D4 to D6	I/O	Data signal input/output pin. Not used in this unit (Opened)
75	VSS	—	Ground pin
76	D7	I/O	Data signal input/output pin. Not used in this unit (Opened)
77	ERR	I/O	Input/output pin of error (C2PO) data to external RAM. Not used in this unit (Opened)
78	EXTC2R	I	External RAM selection input for error data writing (“H”: External RAM). (Fixed at “L”)
79	BUSY	O	RAM access BUSY signal output. Not used in this unit (Opened)
80	EMP	O	EMPTY or immediately before FULL of ATRAC data (When DSC=ASC+1: “H”). Not used in this unit (Opened)
81	FUL	O	FULL or immediately before EMPTY of ATRAC data (When ASC=DSC+1: “H”). Not used in this unit (Opened)
82	EQL	O	ATRAC data EMPTY (When DSC=ASC: “H”). Not used in this unit
83	MDLK	O	Indicates recording/playback data main/sub (“H”: Sub, Linking: “L”: Main). Not used in this unit
84	CPSY	O	Interpolation sync signal output. Not used in this unit
85	CTMD0	O	DSC counter mode output. Not used in this unit
86	CTMD1	O	
87	SPO	O	Output of system clock (512fs=22.5792 MHz) signal to CXD2535BR (IC121)
88	VSS	—	Ground pin
89	MDSY	O	Main data sync detection signal output. Not used in this unit
90	LRCK	I	Input of L/R clock signal from CXD2535BR (IC121) (44.1 kHz)
91	BCK	I	Input of bit clock signal from CXD2535BR (IC121) (2.8224 MHz)
92	C2PO	I	Input of C2PO signal from CXD2535BR (IC121) (Shows data error status) Playback:C2PO (“H”). Digital recording: D.In-Vflag. Analog recording: “L”
93	DATA	I/O	Recording:Output of recording audio data signal to CXD2535BR (IC121) Playback:Input of playback audio data signal from CXD2535BR (IC121)
94	DIDT	I	Input of digital audio input 16-bit data from CXD2535BR (IC121)
95	DODT	O	Output of digital audio output 16-bit data to CXD2535BR (IC121)
96	DIRCPB	O	Disc drive and EFM encoder/decoder recording/playback mode output. Not used in this unit
97	MIN	I	Input of defect ON/OFF switching signal from CXD2535BR (IC121)
98	SPOSL	I	Pin 87 (SPO) input/output switching input pin (“L”:IN. “H”:OUT). (Fixed at “H”)
99	MCK	O	RAM controller internal master clock output pin. Not used in this unit
100	VSS	—	Ground pin

• IC301 A/D Converter (CXD8566M)

Pin No.	Pin Name	I/O	Function
1	AINL+	I	Lch analog (+) input
2	AINL-	I	Lch analog (-) input
3	VREFIN	I	Reference voltage input (+3.2V)
4	AVDD	—	Modulator analog power supply (+5V)
5	AVss	—	Modulator analog Ground
6	ANAPD	I	Modulator power down. “H”: Normal operation, “L”: Power down. (Fixed at “H”)
7	HPBYP	I	Test pin. (Fixed at “L”)
8	MODE2	I	Mode setting. (Fixed at “L”)
9	OSFL	O	Lch overflow flag output (Not used in this unit) (Opened)
10	DIGPD	I	Decimation filter power down. “H”: Normal operation, “L”: Power down/reset
11	TEST	I	Test pin. (Fixed at “L”)
12	CMODE	I	Master clock selection. “H”: 384fs, “L”: 256fs. (Fixed at “L”)
13	SMODE	I	Mode setting. (Fixed at “L”)
14	LRCK	I/O	Master mode: LRCK output, slave mode: LRCK input
15	BCK	I/O	Master mode: BCK output, slave mode: BCK input
16	DATA	O	DATA output
17	FSYNC	I/O	Master mode: FSYNC output, slave mode: FSYNC input
18	DVDD	—	Decimation filter power supply (+5V)
19	DVss	—	Decimation filter Ground
20	256FSI	I	Master clock input (256fs)
21	OSFR	O	Rch overflow flag output (Not used in this unit) (Opened)
22	MODE1	I	Mode setting. (Fixed at “L”)
23	NC	—	Not used in this unit (Opened)
24	VLOGIC	—	Modulator logic power supply (+5V)
25	LGND	—	Modulator logic Grund
26	VREFO	O	Reference voltage output
27	AINR-	I	Rch analog (-) input
28	AINR+	I	Rch analog (+) input



• **IC701 Display control, LED drive**

Pin No.	Pin Name	I/O	Function
1 to 3	—	—	Not used in this unit (connected to ground)
4	AVss	—	Ground pin (A/D converter)
5, 6	—	—	Not used in this unit (connected to ground)
7	AVREF1	—	Reference voltage input to D/A converter (+5V)
8	RXD	I	UART data input from system controller (IC201)
9	TXD	O	UART data output to system controller (IC201)
10	CTS	I	UART data transmission request signal input from system controller (IC201)
11	RTS	O	UART data transmission request signal output to system controller (IC201)
12	SDATA	O	Serial data output to Fluorescent tube driver (IC702)
13	SCK	O	Serial clock output to Fluorescent tube driver (IC702)
14	$\overline{CS}$	O	Chip select signal output to Fluorescent tube driver (IC702)
15	RST-OUT	O	Reset signal output to Fluorescent tube driver (IC702)
16 to 26	—	—	Not used in this unit (connected to ground)
27	LED1	I	Not used in this unit (Opened)
28 to 31	LED2 to LED5	I	LED drive “L”: Active
32	—	—	Not used in this unit (connected to ground)
33	Vss	—	Ground pin
34 to 51	—	—	Not used in this unit (connected to ground)
52	—	O	Attenuate ON/OFF output “L”: -6 dB attenuate
53 to 58	—	—	Not used in this unit (connected to ground)
59	P-OFF	O	Forced reset output to system controller (IC201)
60	$\overline{RESET}$	I	Reset signal output “L”: Active
61	BUS-IN	I	AU BUS signal input
62	BUS-OUT	O	AU BUS signal output
63, 64	EN-IN	I	Encoder input
65 to 67	GND	—	Ground pin
68	VDD	—	Power supply pin (+5V)
69	X2	I	Main clock (5 MHz)
70	X1	O	
71	GND	—	Ground pin
72	—	—	Not used in this unit (Opened)
73	GND	—	Ground pin
74	AVDD	—	Power supply pin (+5V) (A/D converter)
75	AVREF0	—	Reference voltage input to A/D converter (+5V)
76 to 78	KEY1 to KEY3	I	Key input
79, 80	—	—	Not used in this unit (connected to ground)

## SECTION 6 EXPLODED VIEWS

### NOTE:

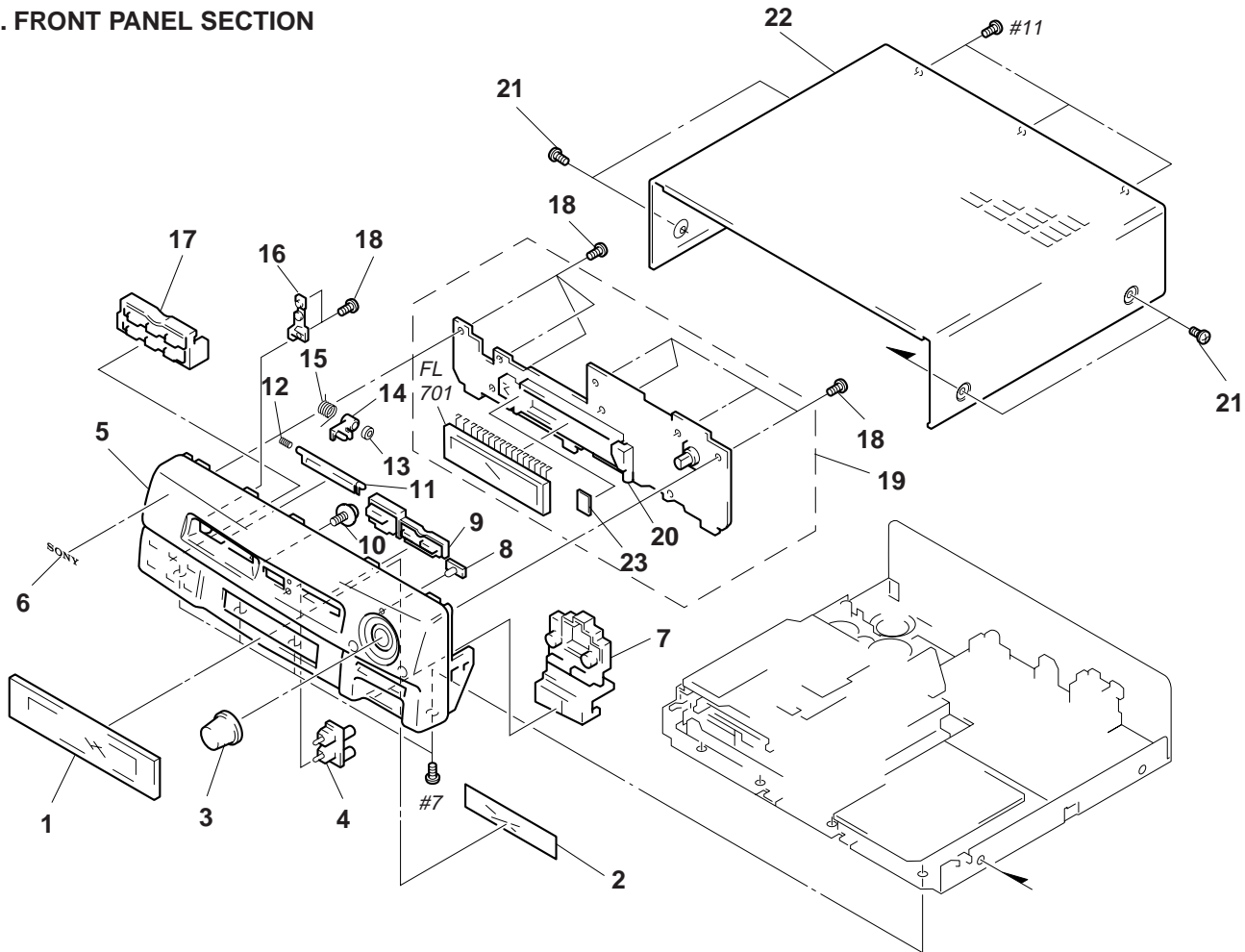
- Items marked “\*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

- Abbreviation  
CND : Canadian model  
HK : Hong Kong model  
SP : Singapore model.  
JE : Tourist model

The components identified by mark  $\triangle$  or dotted line with mark  $\triangle$  are critical for safety.  
Replace only with part number specified.

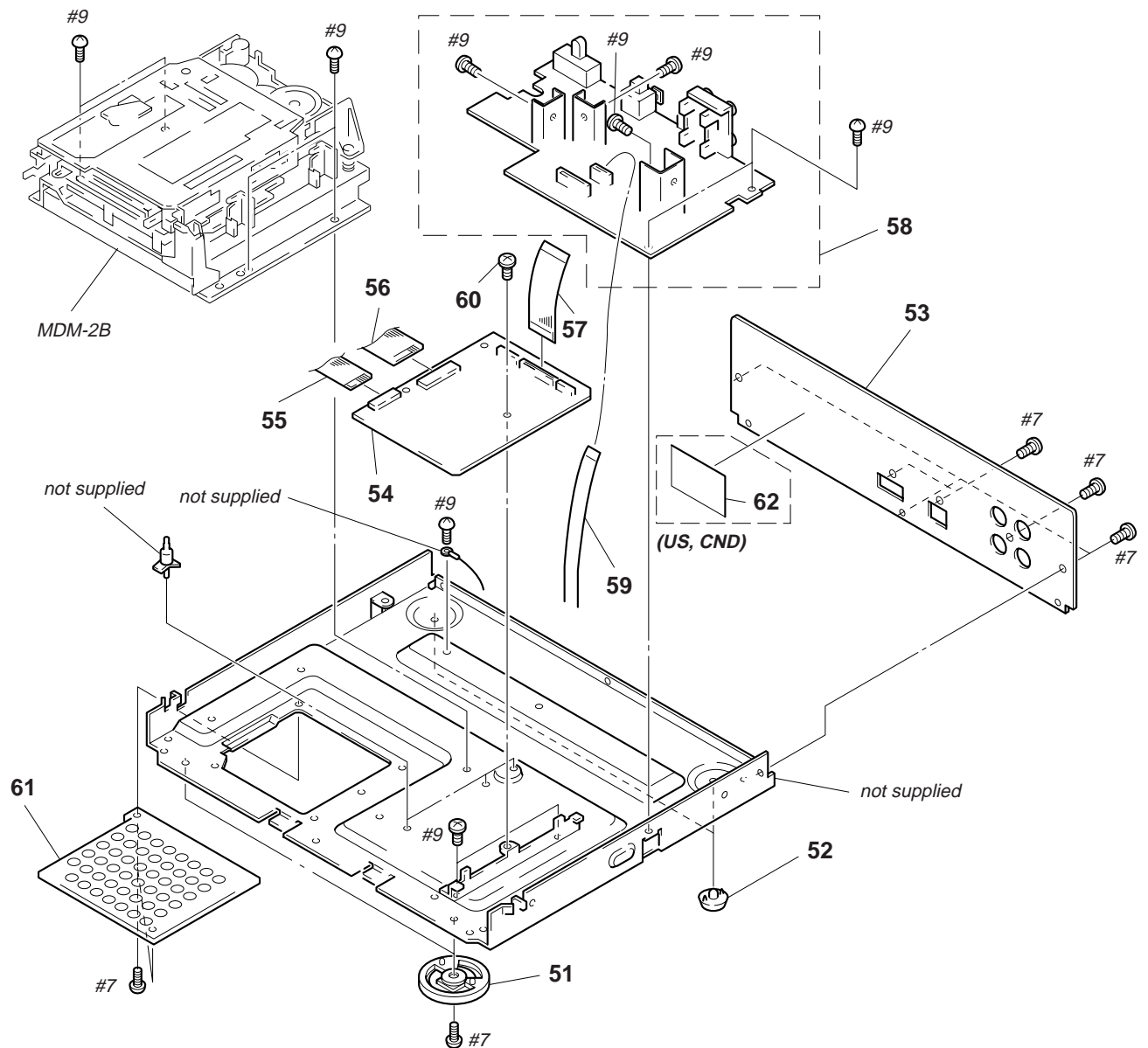
Les composants identifiés par une marque  $\triangle$  sont critiques pour la sécurité.  
Ne les remplacer que par une pièce portant le numéro spécifié.

### 6-1. FRONT PANEL SECTION



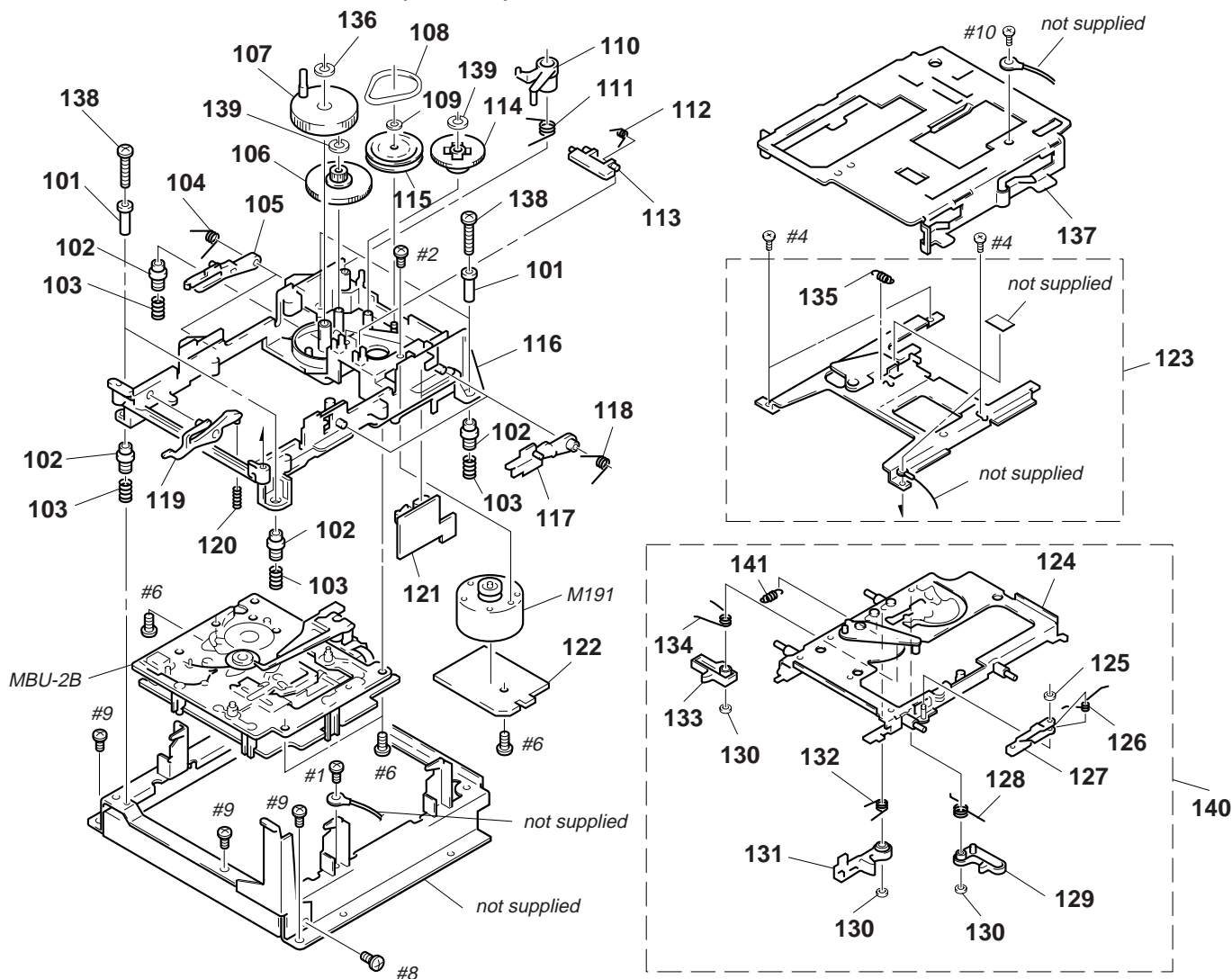
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-977-668-01	WINDOW (FL)		14	4-969-213-01	LEVER (LID)	
2	4-979-353-01	FILTER (MD)		15	4-972-652-01	SPRING, TORSION	
3	4-977-680-01	KNOB (JOG)		16	X-4945-295-1	BRACKET (LEVER) ASSY	
4	4-977-677-01	INDICATOR (DIGITAL)		17	4-977-671-01	BUTTON (MODE)	
5	4-977-667-01	PANEL, FRONT		18	4-951-620-01	SCREW (2.6X8), +BVTP	
6	4-962-708-01	EMBLEM (4-A), SONY		* 19	A-4699-001-A	PANEL BOARD, COMPLETE (SP,HK,JE)	
7	X-4946-465-1	BUTTON (PLAY) ASSY		* 19	A-4699-005-A	PANEL BOARD, COMPLETE (US,CND)	
8	4-977-676-01	INDICATOR (JOG)					
9	4-977-672-01	BUTTON (EJECT)		* 20	4-977-695-01	HOLDER (FL)	
10	4-933-134-01	SCREW (+PTPWH M2.6X6)		21	3-363-099-01	SCREW (CASE 3 TP2)	
11	4-977-669-01	LID (CARTRIDGE)		* 22	4-970-927-61	CASE	
12	4-978-356-01	SPRING (LID), TORSION		* 23	4-955-901-01	CUSHION (FL)	
13	3-681-678-00	WASHER, SLIT		FL701	1-517-461-11	INDICATOR TUBE, FLUORESCENT	

## 6-2. CHASSIS SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	4-977-699-11	LEG (F)		57	1-776-168-11	WIRE (FLAT TYPE) (21 CORE)	
52	4-965-822-01	FOOT		* 58	A-4699-000-A	POWER BOARD, COMPLETE (SP,HK,JE)	
* 53	4-977-679-21	PANEL, BACK (SP,HK,JE)		* 58	A-4699-004-A	POWER BOARD, COMPLETE (US,CND)	
* 53	4-977-679-31	PANEL, BACK (US,CND)		59	1-775-925-11	WIRE (FLAT TYPE) (10 CORE)	
* 54	A-4699-002-A	DIGITAL BOARD, COMPLETE (SP,HK,JE)		60	4-962-641-01	SCREW (+PSWTT 3X8)	
* 54	A-4699-006-A	DIGITAL BOARD, COMPLETE (US,CND)		61	4-969-237-01	LID (CHASSIS)	
55	1-776-417-11	WIRE (FLAT TYPE) (18 CORE)		62	3-703-044-26	LABEL, CAUTION (US,CND)	
56	1-776-416-11	WIRE (FLAT TYPE) (30 CORE)					

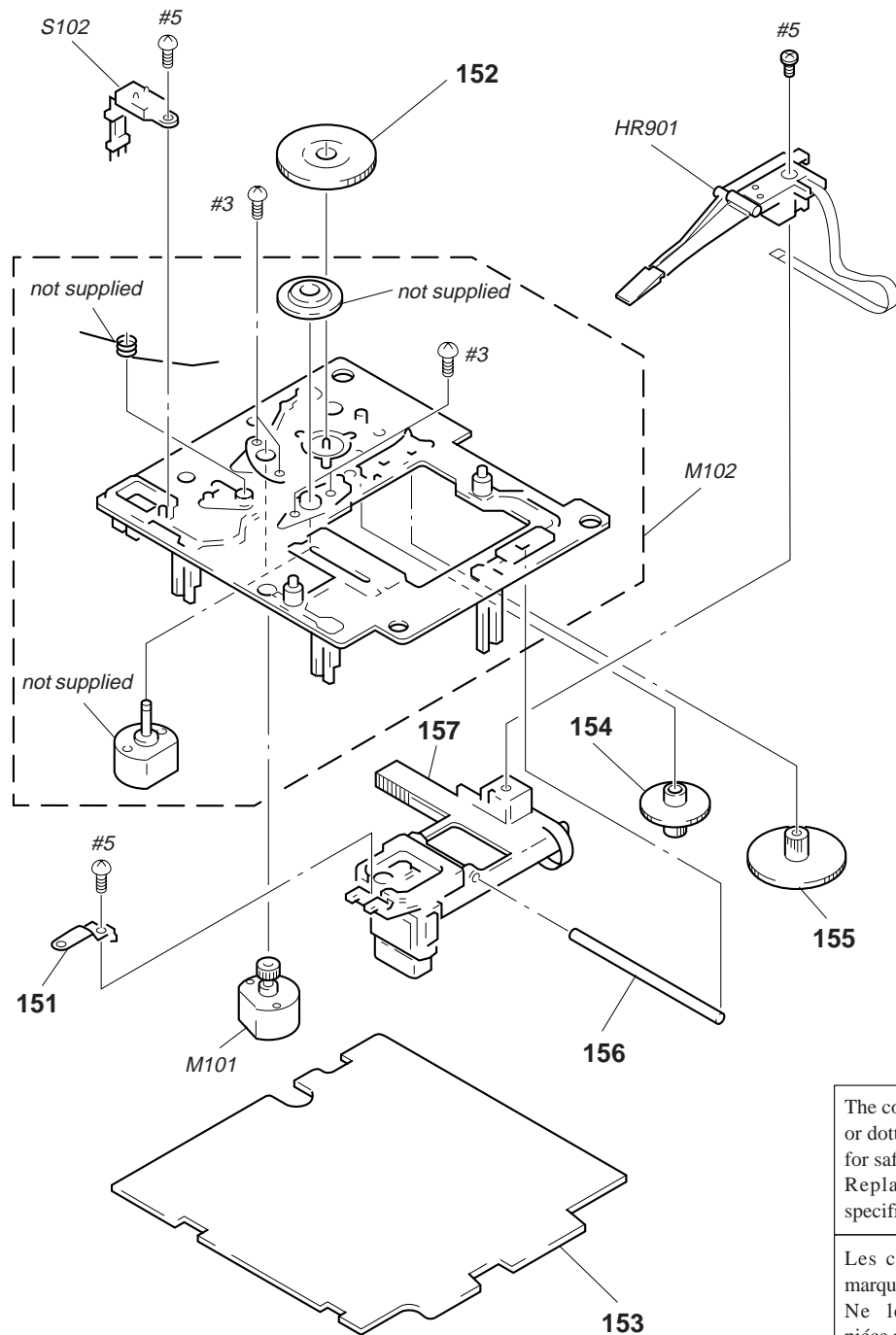
### 6-3. MECHANISM DECK SECTION (MDM-2B)



Ref. No.	Part No.	Description	Remark
101	4-983-100-01	COLLAR (DAMPER)	
102	4-967-671-01	INSULATOR (MD)	
103	4-967-673-01	SPRING, COMPRESSION	
104	4-967-668-01	SPRING (UDL), TORSION	
105	4-967-667-01	LEVER (UDL)	
106	4-967-655-01	GEAR (BD-B)	
107	X-4945-069-1	CAM ASSY	
108	4-967-656-01	BELT (BD)	
109	4-968-919-31	WASHER, STOPPER	
110	4-967-637-01	LEVER (SLM)	
111	4-967-638-01	SPRING (SLM), TORSION	
112	4-968-273-01	SPRING (OWH), TORSION	
113	4-968-272-01	LEVER (OWH)	
114	4-967-654-01	GEAR (BD-A)	
115	4-957-794-01	PULLEY (GEAR 1)	
* 116	X-4945-068-1	BASE (BD) ASSY	
117	4-967-669-01	LEVER (UDR)	
118	4-967-670-01	SPRING (UDR), TORSION	
119	4-967-657-01	LEVER (DOOR)	
120	4-970-710-01	SPRING, COMPRESSION	
* 121	1-653-411-11	DETECTION SW BOARD	

Ref. No.	Part No.	Description	Remark
* 122	1-653-412-11	MOTOR BOARD	
123	A-4660-647-1	BRACKET (LVO) ASSY	
124	X-4946-378-1	HOLDER ASSY	
125	4-968-919-11	WASHER, STOPPER	
126	4-967-646-01	SPRING (SHT), TORSION	
127	4-967-645-01	LEVER (SHT)	
128	4-977-450-01	SPRING (LM), TORSION	
129	4-967-639-01	LEVER (LM)	
130	4-968-919-01	WASHER, STOPPER	
131	4-967-641-01	LEVER (L)	
132	4-967-642-01	SPRING (L), TORSION	
133	4-967-643-01	LEVER (LS)	
134	4-967-644-01	SPRING (LS), TORSION	
135	4-967-664-01	SPRING, TENSION	
136	4-968-919-21	WASHER, STOPPER	
* 137	X-4945-872-1	SLIDER (M) ASSY	
138	4-972-910-01	SCREW (2.6X18), +B	
139	4-968-919-41	WASHER, STOPPER	
140	A-4660-953-B	HOLDER COMPLETE ASSY BOARD, COMPLETE	
141	4-971-743-02	SPRING, TENSION	
M191	A-4660-646-A	MOTOR ASSY (LOADING)	

## 6-4. BASE UNIT SECTION (MBU-2)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	4-967-679-01	SPRING (OP), LEAF		156	4-967-678-01	SHAFT (OP)	
152	4-967-675-01	GEAR (SL-A)		⚠ 157	8-583-009-11	OPTICAL PICK-UP KMS-210A/J-N	
* 153	A-4673-174-A	BD BOARD, COMPLETE		HR901	1-500-304-21	HEAD, OVER LIGHT (RF322-74A)	
154	4-967-676-01	GEAR (SL-B)		M101	A-4660-651-A	MOTOR ASSY (SLED)	
155	4-967-677-01	GEAR (SL-C)		M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)	
				S102	1-762-148-11	SWITCH, PUSH (2 KEY) (REFLECT/PROTECT)	

## SECTION 7 ELECTRICAL PARTS LIST

### Note:

The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety.  
Replace only with part number specified.

Les composants identifiés par une marque  $\Delta$  sont critiques pour la sécurité.  
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked “\*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS  
All resistors are in ohms  
METAL: Metal-film resistor  
METAL OXIDE: Metal Oxide-film resistor  
F : nonflammable
- SEMICONDUCTORS  
In each case, u:  $\mu$ , for example:  
uA...:  $\mu$  A..., uPA...:  $\mu$  PA..., uPB...:  $\mu$  PB...,  
uPC...:  $\mu$  PC..., uPD...:  $\mu$  PD...

- CAPACITORS  
uF :  $\mu$  F
- COILS  
uH :  $\mu$  H
- Abbreviation  
CND : Canadian model  
HK : Hong Kong model  
SP : Singapore model  
JE : Tourist model

### \* NOTE

For replacement of IC121 and IC171 on the BD board, refer to the service note on page 5.

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
*	A-4673-174-A	BD BOARD, COMPLETE *****				C152	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CAPACITOR >				C155	1-104-916-11	TANTAL. CHIP	6.8uF	20%	20V
C101	1-104-913-11	TANTAL. CHIP	10uF	20%	16V	C160	1-104-601-11	ELECT CHIP	10uF	20%	10V
C102	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C161	1-104-601-11	ELECT CHIP	10uF	20%	10V
C103	1-104-913-11	TANTAL. CHIP	10uF	20%	16V	C163	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C104	1-104-913-11	TANTAL. CHIP	10uF	20%	16V	C164	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C105	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C166	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C106	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V	C167	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C107	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C169	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C108	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C170	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C109	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	C171	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C111	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	C175	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C112	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C176	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C113	1-107-682-11	CERAMIC CHIP	1uF	10%	16V	C177	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C114	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C178	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C115	1-107-682-11	CERAMIC CHIP	1uF	10%	16V	C181	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C116	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	C182	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C117	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	C183	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C119	1-104-913-11	TANTAL. CHIP	10uF	20%	16V	C184	1-107-836-11	ELECT CHIP	22uF	20%	8V
C121	1-126-395-11	ELECT	22uF	20%	16V	C185	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
C122	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C186	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C191	1-126-395-11	ELECT	22uF	20%	16V
C124	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C192	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C125	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V	C193	1-164-346-11	CERAMIC CHIP	1uF		16V
C126	1-107-682-11	CERAMIC CHIP	1uF	10%	16V	C194	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C127	1-163-038-91	CERAMIC CHIP	0.1uF		25V			< CONNECTOR >			
C128	1-164-232-11	CERAMIC CHIP	0.01uF		50V	CN101	1-766-508-11	CONNECTOR, FFC/FPC (ZIF) 22P			
C129	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V	CN102	1-766-510-21	CONNECTOR, FFC/FPC 30P			
C130	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	CN103	1-766-509-21	CONNECTOR, FFC/FPC 18P			
C131	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V	CN104	1-766-898-21	HOUSING, CONNECTOR(PC BOARD)4P			
C132	1-107-682-11	CERAMIC CHIP	1uF	10%	16V			< DIODE >			
C133	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	D101	8-719-988-62	DIODE 1SS355			
C134	1-163-038-91	CERAMIC CHIP	0.1uF		25V	D155	8-719-031-17	DIODE 1SS322-TE85L			
C135	1-163-038-91	CERAMIC CHIP	0.1uF		25V	D161	8-719-421-15	DIODE MA8027-L			
C136	1-126-206-11	ELECT CHIP	100uF	20%	6.3V	D181	8-719-033-60	DIODE F1P2STP			
C141	1-163-038-91	CERAMIC CHIP	0.1uF		25V	D183	8-719-033-60	DIODE F1P2STP			
C142	1-163-251-11	CERAMIC CHIP	100PF	5%	50V			< IC >			
C143	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	IC101	8-752-072-68	IC CXA1981AR			
C144	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	IC102	8-759-243-19	IC TC7SU04F			
C151	1-104-913-11	TANTAL. CHIP	10uF	20%	16V						

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
IC121	8-752-375-06	IC CXD2535AR *NOTE		R116	1-216-069-00	METAL CHIP 6.8K	5% 1/10W
IC121	8-752-375-36	IC CXD2535BR * NOTE		R117	1-216-113-00	METAL CHIP 470K	5% 1/10W
IC122	8-759-243-19	IC TC7SU04F		R120	1-216-025-91	METAL GLAZE 100	5% 1/10W
				R121	1-216-097-91	METAL GLAZE 100K	5% 1/10W
IC151	8-759-179-60	IC MPC17A38VMEL		R122	1-216-295-91	CONDUCTOR, CHIP (2012)	
IC171	8-759-504-12	IC X24C01S * NOTE					
IC172	8-759-149-73	IC uPC842G2		R123	1-216-037-00	METAL CHIP 330	5% 1/10W
IC181	8-759-095-65	IC TC74ACT540FS		R124	1-216-025-91	METAL GLAZE 100	5% 1/10W
IC182	8-759-243-19	IC TC7SU04F		R125	1-216-025-91	METAL GLAZE 100	5% 1/10W
				R128	1-216-053-00	METAL CHIP 1.5K	5% 1/10W
IC191	8-759-822-99	IC L88MS05T-FA		R129	1-216-037-00	METAL CHIP 330	5% 1/10W
		< COIL >					
L101	1-414-234-11	INDUCTOR, FERRITE BEAD		R130	1-216-041-00	METAL CHIP 470	5% 1/10W
L102	1-414-234-11	INDUCTOR, FERRITE BEAD		R131	1-216-073-00	METAL CHIP 10K	5% 1/10W
L103	1-414-234-11	INDUCTOR, FERRITE BEAD		R132	1-216-097-91	METAL GLAZE 100K	5% 1/10W
L105	1-414-234-11	INDUCTOR, FERRITE BEAD		R133	1-216-129-00	METAL CHIP 2.2M	5% 1/10W
L106	1-414-234-11	INDUCTOR, FERRITE BEAD		R134	1-216-037-00	METAL CHIP 330	5% 1/10W
L121	1-414-234-11	INDUCTOR, FERRITE BEAD		R135	1-216-053-00	METAL CHIP 1.5K	5% 1/10W
L122	1-412-039-51	INDUCTOR CHIP 100uH		R136	1-216-041-00	METAL CHIP 470	5% 1/10W
L151	1-412-622-51	INDUCTOR 10uH		R137	1-216-025-91	METAL GLAZE 100	5% 1/10W
L152	1-412-622-51	INDUCTOR 10uH		R139	1-216-017-91	METAL GLAZE 47	5% 1/10W
L153	1-412-039-51	INDUCTOR CHIP 100uH		R140	1-216-017-91	METAL GLAZE 47	5% 1/10W
L154	1-412-039-51	INDUCTOR CHIP 100uH		R141	1-216-295-91	CONDUCTOR, CHIP (2012)	
L155	1-410-980-51	INDUCTOR CHIP 1mH		R142	1-216-073-00	METAL CHIP 10K	5% 1/10W
L161	1-414-234-11	INDUCTOR, FERRITE BEAD		R143	1-216-073-00	METAL CHIP 10K	5% 1/10W
L162	1-414-234-11	INDUCTOR, FERRITE BEAD		R144	1-216-025-91	METAL GLAZE 100	5% 1/10W
L195	1-233-316-21	FILTER, CHIP EMI		R145	1-216-121-91	METAL GLAZE 1M	5% 1/10W
		< MOTOR >					
M101	A-4660-651-A	MOTOR ASSY (SLED)		R146	1-216-037-00	METAL CHIP 330	5% 1/10W
M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)		R147	1-216-025-91	METAL GLAZE 100	5% 1/10W
				R148	1-216-045-00	METAL CHIP 680	5% 1/10W
				R150	1-216-295-91	CONDUCTOR, CHIP (2012)	
		< TRANSISTOR >		R151	1-216-097-91	METAL GLAZE 100K	5% 1/10W
Q101	8-729-905-12	TRANSISTOR DTA144EU		R154	1-220-262-11	METAL GLAZE 680	5% 1/4W
Q151	8-729-905-18	TRANSISTOR DTC144EU		R155	1-220-262-11	METAL GLAZE 680	5% 1/4W
Q162	8-729-101-07	TRANSISTOR 2SB798-DL		R158	1-216-121-91	METAL GLAZE 1M	5% 1/10W
Q163	8-729-905-12	TRANSISTOR DTA144EU		R161	1-216-057-00	METAL CHIP 2.2K	5% 1/10W
Q164	8-729-924-19	TRANSISTOR DTA123JU		R162	1-216-057-00	METAL CHIP 2.2K	5% 1/10W
Q181	8-729-018-75	TRANSISTOR 2SJ278MY		R163	1-216-057-00	METAL CHIP 2.2K	5% 1/10W
Q182	8-729-017-65	TRANSISTOR 2SK1764KY		R164	1-216-045-00	METAL CHIP 680	5% 1/10W
				R165	1-216-097-91	METAL GLAZE 100K	5% 1/10W
				R166	1-220-250-11	METAL GLAZE 10	5% 1/2W
				R167	1-216-065-00	METAL CHIP 4.7K	5% 1/10W
		< RESISTOR >					
R101	1-216-077-00	METAL CHIP 15K	5% 1/10W	R169	1-219-724-11	METAL CHIP 1	1% 1/4W
R102	1-216-073-00	METAL CHIP 10K	5% 1/10W	R170	1-216-073-00	METAL CHIP 10K	5% 1/10W
R103	1-216-073-00	METAL CHIP 10K	5% 1/10W	R171	1-216-073-00	METAL CHIP 10K	5% 1/10W
R104	1-216-049-91	METAL GLAZE 1K	5% 1/10W	R172	1-216-065-00	METAL CHIP 4.7K	5% 1/10W
R105	1-216-065-00	METAL CHIP 4.7K	5% 1/10W	R174	1-216-065-00	METAL CHIP 4.7K	5% 1/10W
R106	1-216-133-00	METAL CHIP 3.3M	5% 1/10W	R176	1-216-065-00	METAL CHIP 4.7K	5% 1/10W
R107	1-216-113-00	METAL CHIP 470K	5% 1/10W	R178	1-216-065-00	METAL CHIP 4.7K	5% 1/10W
R110	1-216-077-00	METAL CHIP 15K	5% 1/10W	R181	1-216-073-00	METAL CHIP 10K	5% 1/10W
R113	1-216-061-00	METAL CHIP 3.3K	5% 1/10W	R182	1-216-089-91	METAL GLAZE 47K	5% 1/10W
R114	1-216-025-91	METAL GLAZE 100	5% 1/10W	R183	1-216-089-91	METAL GLAZE 47K	5% 1/10W
				R186	1-216-134-00	METAL CHIP 2.2	5% 1/8W
				R187	1-216-134-00	METAL CHIP 2.2	5% 1/8W

\* NOTE  
For replacement of IC121 and IC171 on the BD board, refer to the service note on page 5.



Ref. No.	Part No.	Description	Remark			
< VARIABLE RESISTOR >						
RV101	1-241-396-11	RES, ADJ, METAL GLAZE 22K				
RV102	1-241-396-11	RES, ADJ, METAL GLAZE 22K				
< SWITCH >						
S101	1-572-467-41	SWITCH, PUSH (1 KEY) (LIMIT)				
S102	1-762-148-11	SWITCH, PUSH (2 KEY) (REFLECT/PROTECT)				
*****						
*	1-653-411-11	DETECTION SW BOARD	*****			
< CONNECTOR >						
CN193	1-770-010-21	CONNECTOR, BOARD TO BOARD 4P				
< SWITCH >						
S191	1-762-149-11	SWITCH, PUSH (1 KEY) (LOAD OUT DET)				
S192	1-762-149-11	SWITCH, PUSH (1 KEY) (LOAD IN DET)				
S193	1-762-149-11	SWITCH, PUSH (1 KEY) (CHUCKING IN DET)				
*****						
*	A-4699-002-A	DIGITAL BOARD, COMPLETE (HK,SP,JE)	*****			
*	A-4699-006-A	DIGITAL BOARD, COMPLETE (US,CND)	*****			
< CAPACITOR >						
C202	1-163-025-11	CERAMIC CHIP	0.001uF		50V	
C203	1-163-025-11	CERAMIC CHIP	0.001uF		50V	
C204	1-163-025-11	CERAMIC CHIP	0.001uF		50V	
C206	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C207	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C209	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C212	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C213	1-126-395-11	ELECT	22uF	20%	16V	
C214	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
C216	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C274	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C275	1-163-091-00	CERAMIC CHIP	8PF		50V	
C276	1-163-091-00	CERAMIC CHIP	8PF		50V	
C277	1-216-295-91	CONDUCTOR, CHIP (2012)				
C280	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C281	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C282	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C285	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C286	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C288	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C301	1-126-395-11	ELECT	22uF	20%	16V	
C302	1-126-395-11	ELECT	22uF	20%	16V	
C303	1-126-204-11	ELECT CHIP	47uF	20%	16V	

Ref. No.	Part No.	Description	Remark			
C304	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C305	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C306	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C307	1-163-097-00	CERAMIC CHIP	15PF	5%	50V	
C308	1-163-097-00	CERAMIC CHIP	15PF	5%	50V	
C309	1-126-395-11	ELECT	22uF	20%	16V	
C310	1-126-395-11	ELECT	22uF	20%	16V	
C311	1-163-001-11	CERAMIC CHIP	220PF	10%	50V	
C312	1-163-001-11	CERAMIC CHIP	220PF	10%	50V	
C313	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C314	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C315	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C316	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C317	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C318	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C319	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C320	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C321	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C322	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C323	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C326	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C327	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C331	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C333	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C334	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C341	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C342	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C343	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C344	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C348	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)				
C348	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)				
C351	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C352	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C353	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C354	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C355	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C356	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C357	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C361	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	
C362	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	
C363	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	
C364	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	
C365	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	
C366	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	
C367	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C368	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C411	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C412	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
C413	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C414	1-163-025-11	CERAMIC CHIP	0.001uF		50V	
C415	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	
C416	1-163-038-91	CERAMIC CHIP	0.1uF		25V	

(HK,SP,JE)

Ref. No.	Part No.	Description	Remark		Ref. No.	Part No.	Description	Remark	
C416	1-164-346-11	CERAMIC CHIP 1uF	16V	(US,CND)	IC301	8-759-352-63	IC CXD8566M		
C417	1-163-038-91	CERAMIC CHIP 0.1uF	25V		IC302	8-759-352-59	IC CXA8054M		
C418	1-163-038-91	CERAMIC CHIP 0.1uF	25V		IC341	8-759-362-47	IC CXD8567AM		
C419	1-163-038-91	CERAMIC CHIP 0.1uF	25V		IC342	8-759-636-55	IC M5218AFP		
C420	1-126-204-11	ELECT CHIP 47uF	20%	16V	IC411	8-759-158-96	IC TC9246F-TP1		
C421	1-163-235-11	CERAMIC CHIP 22PF	5%	50V	IC412	8-759-242-70	IC TC7WU04F		
				(US,CND)	IC431	8-759-040-83	IC BA6287F		
C423	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)			< COIL >				
C423	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)			L221	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)		
C431	1-163-038-91	CERAMIC CHIP 0.1uF	25V		L221	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)		
C471	1-163-038-91	CERAMIC CHIP 0.1uF	25V		L302	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)		
C472	1-163-038-91	CERAMIC CHIP 0.1uF	25V		L302	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)		
C473	1-216-295-91	CONDUCTOR, CHIP (2012)			L341	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)		
C474	1-163-038-91	CERAMIC CHIP 0.1uF	25V		L341	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)		
C476	1-163-037-11	CERAMIC CHIP 0.022uF	10%	25V	L344	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)		
C477	1-163-038-91	CERAMIC CHIP 0.1uF	25V		L344	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)		
C999	1-163-117-00	CERAMIC CHIP 100PF	5%	50V	L411	1-412-332-41	INDUCTOR 2.2uH		
< CONNECTOR >					L412	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)		
CN202	1-774-031-21	CONNECTOR, FFC/FPC 30P			L412	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)		
CN203	1-750-493-31	PIN, CONNECTOR (PC BOARD) 5P			< RESISTOR >				
CN221	1-774-030-21	CONNECTOR, FFC/FPC 18P			R203	1-216-097-91	METAL GLAZE 100K	5%	1/10W
CN223	1-774-333-21	CONNECTOR, FFC/FPC 21P			R204	1-216-097-91	METAL GLAZE 100K	5%	1/10W
* CN251	1-770-154-11	PIN, CONNECTOR (PC BOARD) 6P			R205	1-216-097-91	METAL GLAZE 100K	5%	1/10W
* CN281	1-770-153-11	PIN, CONNECTOR (PC BOARD) 8P			R206	1-216-073-00	METAL CHIP 10K	5%	1/10W
< DIODE >					R207	1-216-073-00	METAL CHIP 10K	5%	1/10W
D301	8-719-914-42	DIODE DA204K			R208	1-216-073-00	METAL CHIP 10K	5%	1/10W
D302	8-719-914-42	DIODE DA204K			R209	1-216-097-91	METAL GLAZE 100K	5%	1/10W
D303	8-719-056-15	DIODE F01J4L			R211	1-216-073-00	METAL CHIP 10K	5%	1/10W
D341	8-719-056-15	DIODE F01J4L			R212	1-216-025-91	METAL GLAZE 100	5%	1/10W
D411	8-719-974-98	DIODE HVM17-01			R213	1-216-097-91	METAL GLAZE 100K	5%	1/10W
< FERRITE BEAD >					R214	1-216-049-91	METAL GLAZE 1K	5%	1/10W
FB271	1-216-295-91	CONDUCTOR, CHIP (2012)			R215	1-216-097-91	METAL GLAZE 100K	5%	1/10W
FB272	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)			R216	1-216-073-00	METAL CHIP 10K	5%	1/10W
FB272	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)			R217	1-216-097-91	METAL GLAZE 100K	5%	1/10W
FB273	1-216-295-91	CONDUCTOR, CHIP (2012)			R218	1-216-097-91	METAL GLAZE 100K	5%	1/10W
FB274	1-216-295-91	CONDUCTOR, CHIP (2012)			R219	1-216-097-91	METAL GLAZE 100K	5%	1/10W
FB341	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)			R220	1-216-097-91	METAL GLAZE 100K	5%	1/10W
FB341	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)			R221	1-216-097-91	METAL GLAZE 100K	5%	1/10W
FB411	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)			R222	1-216-073-00	METAL CHIP 10K	5%	1/10W
FB411	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)			R223	1-216-097-91	METAL GLAZE 100K	5%	1/10W
FB412	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)			R224	1-216-097-91	METAL GLAZE 100K	5%	1/10W
FB412	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)			R225	1-216-097-91	METAL GLAZE 100K	5%	1/10W
FB471	1-216-295-91	CONDUCTOR, CHIP (2012)			R226	1-216-097-91	METAL GLAZE 100K	5%	1/10W
< IC >					R228	1-216-097-91	METAL GLAZE 100K	5%	1/10W
IC201	8-759-394-99	IC M37610MD-067FP			R229	1-216-049-91	METAL GLAZE 1K	5%	1/10W
IC222	8-759-344-86	IC MSM514400C-70SJ			R230	1-216-049-91	METAL GLAZE 1K	5%	1/10W
IC271	8-752-371-17	IC CXD2536R			R231	1-216-073-00	METAL CHIP 10K	5%	1/10W
					R232	1-216-097-91	METAL GLAZE 100K	5%	1/10W
					R233	1-216-097-91	METAL GLAZE 100K	5%	1/10W
					R234	1-216-073-00	METAL CHIP 10K	5%	1/10W

# DIGITAL

# MOTOR

# PANEL

Ref. No.	Part No.	Description	Remark
R235	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R236	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R238	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R239	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R240	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R241	1-216-073-00	METAL CHIP 10K 5%	1/10W
R242	1-216-073-00	METAL CHIP 10K 5%	1/10W
R243	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R244	1-216-073-00	METAL CHIP 10K 5%	1/10W
R245	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R246	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R247	1-216-073-00	METAL CHIP 10K 5%	1/10W
R248	1-216-073-00	METAL CHIP 10K 5%	1/10W
R249	1-216-073-00	METAL CHIP 10K 5%	1/10W
R250	1-216-073-00	METAL CHIP 10K 5%	1/10W
R251	1-216-073-00	METAL CHIP 10K 5%	1/10W
R252	1-216-073-00	METAL CHIP 10K 5%	1/10W
R253	1-163-017-00	CERAMIC CHIP 0.0047uF 5%	50V
R254	1-163-017-00	CERAMIC CHIP 0.0047uF 5%	50V
R255	1-163-017-00	CERAMIC CHIP 0.0047uF 5%	50V
R256	1-163-017-00	CERAMIC CHIP 0.0047uF 5%	50V
R257	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R259	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R260	1-216-295-91	CONDUCTOR, CHIP (2012)	
R271	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R272	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R273	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R274	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R275	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R276	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)	
R276	1-216-037-00	METAL CHIP 330 5%	1/10W (US,CND)
R277	1-216-033-00	METAL CHIP 220 5%	1/10W
R278	1-216-033-00	METAL CHIP 220 5%	1/10W
R279	1-216-295-91	CONDUCTOR, CHIP (2012)	
R280	1-216-295-91	CONDUCTOR, CHIP (2012)	
R281	1-216-025-91	METAL GLAZE 100 5%	1/10W
R282	1-216-025-91	METAL GLAZE 100 5%	1/10W
R283	1-216-033-00	METAL CHIP 220 5%	1/10W
R284	1-216-063-91	METAL GLAZE 3.9K 5%	1/10W
R301	1-216-081-00	METAL CHIP 22K 5%	1/10W
R302	1-216-081-00	METAL CHIP 22K 5%	1/10W
R303	1-216-093-00	METAL CHIP 68K 5%	1/10W
R304	1-216-093-00	METAL CHIP 68K 5%	1/10W
R305	1-216-017-91	METAL GLAZE 47 5%	1/10W
R306	1-216-017-91	METAL GLAZE 47 5%	1/10W
R307	1-216-017-91	METAL GLAZE 47 5%	1/10W
R308	1-216-033-00	METAL CHIP 220 5%	1/10W
R310	1-216-295-91	CONDUCTOR, CHIP (2012)	
R316	1-216-295-91	CONDUCTOR, CHIP (2012)	
R341	1-216-025-91	METAL GLAZE 100 5%	1/10W
R343	1-216-295-91	CONDUCTOR, CHIP (2012)	

Ref. No.	Part No.	Description	Remark
R361	1-216-687-11	METAL CHIP 33K 0.5%	1/10W
R362	1-216-687-11	METAL CHIP 33K 0.5%	1/10W
R363	1-208-814-11	METAL CHIP 22K 0.50%	1/10W
R364	1-208-814-11	METAL CHIP 22K 0.50%	1/10W
R365	1-216-687-11	METAL CHIP 33K 0.5%	1/10W
R366	1-216-687-11	METAL CHIP 33K 0.5%	1/10W
R367	1-208-814-11	METAL CHIP 22K 0.50%	1/10W
R368	1-208-814-11	METAL CHIP 22K 0.50%	1/10W
R369	1-216-695-11	METAL CHIP 68K 0.5%	1/10W
R370	1-216-695-11	METAL CHIP 68K 0.5%	1/10W
R371	1-216-695-11	METAL CHIP 68K 0.5%	1/10W
R372	1-216-695-11	METAL CHIP 68K 0.5%	1/10W
R401	1-164-161-11	CERAMIC CHIP 2200PF 10%	50V
R402	1-216-295-91	CONDUCTOR, CHIP (2012) (HK,SP,JE)	
R402	1-414-551-11	MICRO INDUCTOR (CHIP) (US,CND)	
R411	1-208-810-11	METAL CHIP 15K 0.50%	1/10W
R412	1-208-810-11	METAL CHIP 15K 0.50%	1/10W
R413	1-208-810-11	METAL CHIP 15K 0.50%	1/10W
R414	1-208-810-11	METAL CHIP 15K 0.50%	1/10W
R415	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R416	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R417	1-216-121-91	METAL GLAZE 1M 5%	1/10W
R418	1-216-025-91	METAL GLAZE 100 5%	1/10W (HK,SP,JE)
R418	1-216-037-00	METAL CHIP 330 5%	1/10W (US,CND)
R431	1-216-021-00	METAL CHIP 68 5%	1/10W
R432	1-216-021-00	METAL CHIP 68 5%	1/10W
R461	1-216-073-00	METAL CHIP 10K 5%	1/10W
R463	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R471	1-216-295-91	CONDUCTOR, CHIP (2012)	
R601	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R602	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R603	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R604	1-216-073-00	METAL CHIP 10K 5%	1/10W
R605	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R606	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R607	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R608	1-216-073-00	METAL CHIP 10K 5%	1/10W
R609	1-216-097-91	METAL GLAZE 100K 5%	1/10W
R610	1-543-948-11	BEAD, FERRITE (CHIP)	
R611	1-216-295-91	CONDUCTOR, CHIP (2012)	
< VIBRATOR >			
X201	1-760-493-11	VIBRATOR, CERAMIC (CHIP TYPE)(8MHz)	
X203	1-760-841-11	VIBRATOR, CRYSTAL (45MHz)	

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Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
*	1-653-412-11	MOTOR BOARD *****				C743	1-162-282-31	CERAMIC	100PF	10%	50V
		< CAPACITOR >				C744	1-162-282-31	CERAMIC	100PF	10%	50V
C199	1-164-159-11	CERAMIC	0.1uF		50V	C745	1-162-282-31	CERAMIC	100PF	10%	50V
		< CONNECTOR >				C746	1-162-282-31	CERAMIC	100PF	10%	50V
* CN191	1-568-944-11	PIN, CONNECTOR 6P				C747	1-162-282-31	CERAMIC	100PF	10%	50V
CN192	1-770-011-41	CONNECTOR, BOARD TO BOARD 4P				C748	1-162-282-31	CERAMIC	100PF	10%	50V
		< MOTOR >				C750	1-164-159-11	CERAMIC	0.1uF		50V
M191	A-4660-646-A	MOTOR ASSY (LOADING)				< CONNECTOR >					
*****						CN701	1-695-371-31	PIN, CONNECTOR (PC BOARD) 10P			
						< DIODE >					
*	A-4699-001-A	PANEL BOARD, COMPLETE (HK,SP,JE) *****				D701	8-719-046-44	DIODE	SEL5221S (ENTER/YES)		
						D702	8-719-046-44	DIODE	SEL5221S (SELECTOR)		
						D703	8-719-046-44	DIODE	SEL5221S (ATTENUATOR)		
						D704	8-719-046-44	DIODE	SEL5221S (DIGITAL IN)		
						D711	8-719-987-63	DIODE	1N4148M		
*	A-4699-005-A	PANEL BOARD, COMPLETE (US,CND) *****				< FLUORESCENT INDICATOR >					
						FL701	1-517-461-11	INDICATOR TUBE, FLUORESCENT			
*	4-955-901-01	CUSHION (FL)				< IC >					
*	4-977-695-01	HOLDER (FL)				IC701	8-759-388-75	IC	uPD78053GC-084-3B9		
		< CAPACITOR >				IC702	8-759-297-23	IC	M66004M8FP		
C701	1-164-159-11	CERAMIC	0.1uF		50V	< JUMPER RESISTOR >					
C702	1-164-159-11	CERAMIC	0.1uF		50V	JW701	1-164-159-11	CERAMIC	0.1uF		50V
C703	1-126-177-11	ELECT	100uF	20%	10V	JW725	1-249-417-11	CARBON	1K	5%	1/4W F
C705	1-164-159-11	CERAMIC	0.1uF		50V	< COIL >					
C706	1-162-306-11	CERAMIC	0.01uF	30%	16V	L701	1-410-478-11	INDUCTOR	47uH		
						L702	1-410-517-11	INDUCTOR	47uH		
C707	1-162-306-11	CERAMIC	0.01uF	30%	16V	< TRANSISTOR >					
C708	1-162-292-31	CERAMIC	680PF	10%	50V	Q701	8-729-620-05	TRANSISTOR	2SC2603-EF		
C709	1-162-292-31	CERAMIC	680PF	10%	50V	Q702	8-729-620-05	TRANSISTOR	2SC2603-EF		
C710	1-162-292-31	CERAMIC	680PF	10%	50V	Q703	8-729-620-05	TRANSISTOR	2SC2603-EF		
C711	1-162-294-31	CERAMIC	0.001uF	10%	50V	< RESISTOR >					
C712	1-162-294-31	CERAMIC	0.001uF	10%	50V	R701	1-249-441-11	CARBON	100K	5%	1/4W
C713	1-162-294-31	CERAMIC	0.001uF	10%	50V	R702	1-247-807-31	CARBON	100	5%	1/4W
C714	1-162-294-31	CERAMIC	0.001uF	10%	50V	R703	1-247-807-31	CARBON	100	5%	1/4W
C716	1-164-159-11	CERAMIC	0.1uF		50V	R704	1-249-393-11	CARBON	10	5%	1/4W F
C717	1-164-159-11	CERAMIC	0.1uF		50V	R705	1-247-807-31	CARBON	100	5%	1/4W
C718	1-164-159-11	CERAMIC	0.1uF		50V	R707	1-249-429-11	CARBON	10K	5%	1/4W
C719	1-162-282-31	CERAMIC	100PF	10%	50V	R708	1-249-425-11	CARBON	4.7K	5%	1/4W F
C720	1-164-159-11	CERAMIC	0.1uF		50V	R709	1-249-429-11	CARBON	10K	5%	1/4W
C721	1-124-638-11	ELECT	22uF	20%	10V	R710	1-249-417-11	CARBON	1K	5%	1/4W F
C734	1-162-282-31	CERAMIC	100PF	10%	50V	R711	1-249-429-11	CARBON	10K	5%	1/4W
C735	1-162-282-31	CERAMIC	100PF	10%	50V	R712	1-249-429-11	CARBON	10K	5%	1/4W
C736	1-162-282-31	CERAMIC	100PF	10%	50V	R713	1-249-423-11	CARBON	3.3K	5%	1/4W
C737	1-162-282-31	CERAMIC	100PF	10%	50V						
C738	1-162-282-31	CERAMIC	100PF	10%	50V						
C739	1-162-282-31	CERAMIC	100PF	10%	50V						
C740	1-162-282-31	CERAMIC	100PF	10%	50V						
C741	1-162-282-31	CERAMIC	100PF	10%	50V						
C742	1-162-282-31	CERAMIC	100PF	10%	50V						

# PANEL

# POWER

Ref. No.	Part No.	Description	Remark
R714	1-249-423-11	CARBON 3.3K 5%	1/4W F
R715	1-249-423-11	CARBON 3.3K 5%	1/4W F
R716	1-249-413-11	CARBON 470 5%	1/4W F
R717	1-249-413-11	CARBON 470 5%	1/4W F
R718	1-249-413-11	CARBON 470 5%	1/4W F
R719	1-249-413-11	CARBON 470 5%	1/4W F
R720	1-249-413-11	CARBON 470 5%	1/4W F
R721	1-249-413-11	CARBON 470 5%	1/4W F
R722	1-249-413-11	CARBON 470 5%	1/4W F
R723	1-249-413-11	CARBON 470 5%	1/4W F
R724	1-249-413-11	CARBON 470 5%	1/4W F
R725	1-249-415-11	CARBON 680 5%	1/4W F
R726	1-249-417-11	CARBON 1K 5%	1/4W F
R727	1-247-834-11	CARBON 1.3K 5%	1/4W
R728	1-249-421-11	CARBON 2.2K 5%	1/4W F
R729	1-249-425-11	CARBON 4.7K 5%	1/4W F
R731	1-249-413-11	CARBON 470 5%	1/4W F
R732	1-249-415-11	CARBON 680 5%	1/4W F
R733	1-249-417-11	CARBON 1K 5%	1/4W F
R734	1-247-834-11	CARBON 1.3K 5%	1/4W
R735	1-249-413-11	CARBON 470 5%	1/4W F
R736	1-249-415-11	CARBON 680 5%	1/4W F
R737	1-249-417-11	CARBON 1K 5%	1/4W F
R738	1-249-435-11	CARBON 33K 5%	1/4W
R739	1-249-441-11	CARBON 100K 5%	1/4W
R740	1-249-429-11	CARBON 10K 5%	1/4W
R743	1-249-429-11	CARBON 10K 5%	1/4W
R744	1-249-429-11	CARBON 10K 5%	1/4W
R745	1-249-441-11	CARBON 100K 5%	1/4W
R746	1-249-441-11	CARBON 100K 5%	1/4W
R747	1-249-413-11	CARBON 470 5%	1/4W F
R901	1-249-441-11	CARBON 100K 5%	1/4W
R902	1-249-441-11	CARBON 100K 5%	1/4W
R903	1-249-441-11	CARBON 100K 5%	1/4W
R904	1-249-441-11	CARBON 100K 5%	1/4W
< ROTARY ENCODER >			
RE701	1-467-938-11	ENCODER, ROTARY (SELECTOR)	
< SWITCH >			
S702	1-554-303-21	SWITCH, TACTILE (SCROLL)	
S703	1-554-303-21	SWITCH, TACTILE (DISPLAY)	
S704	1-554-303-21	SWITCH, TACTILE (REPEAT)	
S705	1-554-303-21	SWITCH, TACTILE (CONTINUE)	
S706	1-554-303-21	SWITCH, TACTILE (SHUFFLE)	
S707	1-554-303-21	SWITCH, TACTILE (PROGRAM)	
S709	1-554-303-21	SWITCH, TACTILE (EJECT)	
S710	1-554-303-21	SWITCH, TACTILE (CD SYNC)	
S711	1-554-303-21	SWITCH, TACTILE (REC)	
S712	1-554-303-21	SWITCH, TACTILE (EDIT/NO)	
S713	1-554-303-21	SWITCH, TACTILE (ENTER/YES)	

Ref. No.	Part No.	Description	Remark
S714	1-554-303-21	SWITCH, TACTILE (▶▶)	
S715	1-554-303-21	SWITCH, TACTILE (◀◀)	
S716	1-554-303-21	SWITCH, TACTILE (■)	
S717	1-554-303-21	SWITCH, TACTILE (▶▶)	
< VIBRATOR >			
X701	1-579-233-11	VIBRATOR, CERAMIC (5MHz)	
*****			
*	A-4699-000-A	POWER BOARD, COMPLETE (HK,SP,JE)	
*****			
*	A-4699-004-A	POWER BOARD, COMPLETE (US,CND)	
*****			
7-685-871-01		SCREW +BVTT 3X6 (S)	
< CAPACITOR >			
C101	1-115-364-11	ELECT 22000uF 20%	16V
C102	1-164-159-11	CERAMIC 0.1uF	50V
C103	1-126-933-11	ELECT 100uF 20%	16V
C104	1-126-933-11	ELECT 100uF 20%	16V
C105	1-126-933-11	ELECT 100uF 20%	16V
C106	1-126-933-11	ELECT 100uF 20%	16V
C107	1-126-968-11	ELECT 100uF 20%	50V
C108	1-126-968-11	ELECT 100uF 20%	50V
C109	1-126-969-11	ELECT 220uF 20%	50V
C110	1-126-967-11	ELECT 47uF 20%	50V
C111	1-126-967-11	ELECT 47uF 20%	50V
C112	1-164-159-11	CERAMIC 0.1uF	50V
C113	1-126-968-11	ELECT 100uF 20%	50V
C114	1-126-968-11	ELECT 100uF 20%	50V
C121	1-126-964-11	ELECT 10uF 20%	50V
C122	1-126-947-11	ELECT 47uF 20%	35V
C123	1-164-159-11	CERAMIC 0.1uF	50V
C124	1-110-489-11	CAPACITOR 1F	5.5V
C125	1-124-903-11	ELECT 1uF 20%	50V
C126	1-164-159-11	CERAMIC 0.1uF	50V
C127	1-126-933-11	ELECT 100uF 20%	16V
C130	1-164-159-11	CERAMIC 0.1uF	50V
C131	1-126-947-11	ELECT 47uF 20%	35V
C135	1-164-159-11	CERAMIC 0.1uF	50V
C136	1-164-159-11	CERAMIC 0.1uF	50V
C139	1-162-306-11	CERAMIC 0.01uF 30%	16V
C140	1-164-159-11	CERAMIC 0.1uF	50V
C141	1-164-159-11	CERAMIC 0.1uF	50V
C144	1-126-947-11	ELECT 47uF 20%	35V
C145	1-126-923-11	ELECT 220uF 20%	10V
C147	1-126-923-11	ELECT 220uF 20%	10V
C148	1-126-933-11	ELECT 100uF 20%	16V
C149	1-126-933-11	ELECT 100uF 20%	16V
C150	1-126-947-11	ELECT 47uF 20%	35V
C151	1-126-925-11	ELECT 470uF 20%	10V

Ref. No.	Part No.	Description	Remark				Ref. No.	Part No.	Description	Remark			
C152	1-126-941-11	ELECT	470uF	20%	25V				< IC >				
C153	1-126-941-11	ELECT	470uF	20%	25V								
C202	1-162-600-11	CERAMIC	0.0047uF	30%	16V		IC101	8-759-231-53	IC TA7805S				
C203	1-162-294-31	CERAMIC	0.001uF	10%	50V		IC102	8-759-917-18	IC SN74HCU04AN				
C204	1-126-947-11	ELECT	47uF	20%	35V		IC103	8-759-327-15	IC M62005L				
							IC105	8-749-921-11	IC GP1F32R (MD DIGITAL OPTICAL,DIGITAL IN)				
							IC107	8-759-634-51	IC M5218AP				
C205	1-162-294-31	CERAMIC	0.001uF	10%	50V				< IC LINK >				
C206	1-162-282-31	CERAMIC	100PF	10%	50V		△ ICP101	1-532-839-11	LI NK, IC (PRF1000 1.0A)(HK,SP,JE)				
C301	1-164-159-11	CERAMIC	0.1uF		50V				< JACK >				
C302	1-164-159-11	CERAMIC	0.1uF		50V		J101	1-695-188-31	JACK, PIN 4P (MD,ANALOG IN/OUT)				
C402	1-162-600-11	CERAMIC	0.0047uF	30%	16V				< COIL >				
C403	1-162-294-31	CERAMIC	0.001uF	10%	50V		L101	1-410-478-11	INDUCTOR	47uH			
C404	1-126-947-11	ELECT	47uF	20%	35V		L103	1-412-473-21	INDUCTOR	0uH			
C405	1-162-294-31	CERAMIC	0.001uF	10%	50V				< TRANSISTOR >				
C406	1-162-282-31	CERAMIC	100PF	10%	50V								
< CONNECTOR >							Q101	8-729-118-01	TRANSISTOR	2SB1116-K			
CN101	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)					Q102	8-729-900-65	TRANSISTOR	DTA144ES			
CN102	1-770-649-11	CONNECTOR, FFC/FPC 21P					Q103	8-729-900-65	TRANSISTOR	DTA144ES			
CN104	1-695-333-41	PIN, CONNECTOR (PC BOARD) 10P					Q104	8-729-209-15	TRANSISTOR	2SD2012			
< DIODE >							Q105	8-729-209-15	TRANSISTOR	2SD2012			
D101	8-719-200-77	DIODE 10E2N					Q106	8-729-209-15	TRANSISTOR	2SD2012			
D102	8-719-200-77	DIODE 10E2N					Q107	8-729-900-89	TRANSISTOR	DTC144ES			
D103	8-719-987-63	DIODE 1N4148M					Q108	8-729-900-89	TRANSISTOR	DTC144ES			
D104	8-719-987-63	DIODE 1N4148M					Q109	8-729-620-05	TRANSISTOR	2SC2603-EF			
D105	8-719-200-82	DIODE 11ES2					Q110	8-729-119-76	TRANSISTOR	2SA1175-HFE			
D106	8-719-200-82	DIODE 11ES2					Q111	8-729-900-65	TRANSISTOR	DTA144ES			
D107	8-719-200-82	DIODE 11ES2					Q112	8-729-620-05	TRANSISTOR	2SC2603-EF			
D108	8-719-200-82	DIODE 11ES2					Q113	8-729-900-89	TRANSISTOR	DTC144ES			
D109	8-719-200-82	DIODE 11ES2					Q201	8-729-141-30	TRANSISTOR	2SC3623A-LK			
D110	8-719-200-82	DIODE 11ES2					Q202	8-729-141-30	TRANSISTOR	2SC3623A-LK			
D111	8-719-002-70	DIODE UZL-36L					Q401	8-729-141-30	TRANSISTOR	2SC3623A-LK			
D112	8-719-014-73	DIODE UZP-5.6BC-TP					Q402	8-729-141-30	TRANSISTOR	2SC3623A-LK			
D113	8-719-987-63	DIODE 1N4148M					< RESISTOR >						
D114	8-719-210-21	DIODE 11EQS04					R101	1-260-091-11	CARBON	220	5%	1/2W	
D115	8-719-210-21	DIODE 11EQS04					R102	1-260-091-11	CARBON	220	5%	1/2W	
D116	8-719-987-63	DIODE 1N4148M					R103	1-249-429-11	CARBON	10K	5%	1/4W	
D117	8-719-987-63	DIODE 1N4148M					R110	1-249-413-11	CARBON	470	5%	1/4W	F
D118	8-719-987-63	DIODE 1N4148M					R111	1-249-413-11	CARBON	470	5%	1/4W	F
D119	8-719-987-63	DIODE 1N4148M					R112	1-249-441-11	CARBON	100K	5%	1/4W	
D120	8-719-987-63	DIODE 1N4148M					R114	1-249-417-11	CARBON	1K	5%	1/4W	F
D121	8-719-200-82	DIODE 11ES2					R115	1-249-429-11	CARBON	10K	5%	1/4W	
D122	8-719-200-82	DIODE 11ES2					R116	1-249-437-11	CARBON	47K	5%	1/4W	
D123	8-719-933-36	DIODE HZS6B1L					R117	1-247-891-00	CARBON	330K	5%	1/4W	
D124	8-719-933-39	DIODE HZS6C1L					R118	1-249-417-11	CARBON	1K	5%	1/4W	F
D125	8-719-200-82	DIODE 11ES2					R120	1-247-807-31	CARBON	100	5%	1/4W	
D126	8-719-200-82	DIODE 11ES2					R127	1-247-807-31	CARBON	100	5%	1/4W	
< FUSE >							R129	1-247-887-00	CARBON	220K	5%	1/4W	
△ F101	1-532-776-21	FUSE, MICRO (SECONDARY) (1A 125V) (US,CND)											

The components identified by mark △ or dotted line with mark △ are critical for safety.  
Replace only with part number specified.

Les composants identifiés par une marque △ sont critiques pour la sécurité.  
Ne les remplacer que par une pièce portant le numéro spécifié.



POWER

Ref. No.	Part No.	Description			Remark
R131	1-247-887-00	CARBON	220K	5%	1/4W
R132	1-247-807-31	CARBON	100	5%	1/4W
R133	1-247-807-31	CARBON	100	5%	1/4W
R134	1-249-437-11	CARBON	47K	5%	1/4W
R135	1-247-895-00	CARBON	470K	5%	1/4W
R136	1-247-807-31	CARBON	100	5%	1/4W
R137	1-247-887-00	CARBON	220K	5%	1/4W
R138	1-247-887-00	CARBON	220K	5%	1/4W
R140	1-249-421-11	CARBON	2.2K	5%	1/4W F
R141	1-249-421-11	CARBON	2.2K	5%	1/4W F
R142	1-249-416-11	CARBON	820	5%	1/4W F
R143	1-247-850-11	CARBON	6.2K	5%	1/4W
R144	1-249-393-11	CARBON	10	5%	1/4W F
R145	1-247-807-31	CARBON	100	5%	1/4W
R146	1-249-414-11	CARBON	560	5%	1/4W F
R150	1-247-807-31	CARBON	100	5%	1/4W
R201	1-249-434-11	CARBON	27K	5%	1/4W
R202	1-249-429-11	CARBON	10K	5%	1/4W
R203	1-249-421-11	CARBON	2.2K	5%	1/4W F
R204	1-249-419-11	CARBON	1.5K	5%	1/4W F
R205	1-249-419-11	CARBON	1.5K	5%	1/4W F
R206	1-247-887-00	CARBON	220K	5%	1/4W
R207	1-249-421-11	CARBON	2.2K	5%	1/4W F
R208	1-249-421-11	CARBON	2.2K	5%	1/4W F
R209	1-249-411-11	CARBON	330	5%	1/4W
R210	1-249-433-11	CARBON	22K	5%	1/4W
R301	1-247-807-31	CARBON	100	5%	1/4W
R302	1-249-417-11	CARBON	1K	5%	1/4W F
R401	1-249-434-11	CARBON	27K	5%	1/4W
R402	1-249-429-11	CARBON	10K	5%	1/4W
R403	1-249-421-11	CARBON	2.2K	5%	1/4W F
R404	1-249-419-11	CARBON	1.5K	5%	1/4W F
R405	1-249-419-11	CARBON	1.5K	5%	1/4W F
R406	1-247-887-00	CARBON	220K	5%	1/4W
R407	1-249-421-11	CARBON	2.2K	5%	1/4W F
R408	1-249-421-11	CARBON	2.2K	5%	1/4W F
R409	1-249-411-11	CARBON	330	5%	1/4W
R410	1-249-433-11	CARBON	22K	5%	1/4W
< SWITCH >					
S101	1-554-303-21	SWITCH, TACTILE (RESET)			
*****					

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS	
		*****	
55	1-776-417-11	WIRE (FLAT TYPE) (18 CORE)	
56	1-776-416-11	WIRE (FLAT TYPE) (30 CORE)	
57	1-776-168-11	WIRE (FLAT TYPE) (21 CORE)	
59	1-775-925-11	WIRE (FLAT TYPE) (10 CORE)	
△ 157	8-583-009-11	OPTICAL PICK-UP KMS-210A/J-N	
FL701	1-517-461-11	INDICATOR TUBE, FLUORESCENT	
HR901	1-500-304-21	HEAD, OVER LIGHT (RF322-74A)	
M101	A-4660-651-A	MOTOR ASSY (SLED)	
M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)	
M191	A-4660-646-A	MOTOR ASSY (LOADING)	
S102	1-762-148-11	SWITCH, PUSH (2 KEY) (REFLECT/PROTECT)	
*****			
		*****	
		HARDWARE LIST	
		*****	
#1	7-621-773-86	SCREW +BVTT 2.6X4 (S)	
#2	7-621-775-20	SCREW +B 2.6X5	
#3	7-627-852-08	SCREW,PRECISION +P 1.7X2.5	
#4	7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT	
#5	7-685-105-19	TPG +P 2X8, TYPE 2, NON-SLIT	
#6	7-685-645-79	SCREW +BVTP 3X6 TYPE2 N-S	
#7	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#8	7-685-862-09	SCREW +BVTT 2.6X6 (S)	
#9	7-685-871-01	SCREW +BVTT 3X6 (S)	
#10	7-621-255-25	SCREW +PTT 2X4 (S)	
#11	7-685-872-09	SCREW +BVTT 3X8	

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